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BOARD OF EDUCATION.

REPORT

FOR THE YEAR 1901,

ON THE

MUSEUMS, COLLEGES AND INSTITUTIONS,

UNDER THE ADMINISTRATION OF THE BOARD OF EDUCATION.

Gt. Britain. Board of education.

Presented to Parliament by Command of His Majesty.

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BOARD OF EDUCATION.

REPORT

FOR THE YEAR 1911

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UNDER THE ADMINISTRATION OF THE BOARD OF EDUCATION.

Presented to Parliament by Command of His Majesty.

1911

THE VICTORIA AND ALBERT MUSEUM.

REPORT AND RETURNS FOR THE YEAR 1901.

During the year 1901 the Museum was visited by 836,848 persons, being a slight further decrease on the number for 1900. This decrease occurred on both Free days and Students' days, while the attendances in the evenings and on Sundays shew an increase. Comparative tables shewing the monthly and yearly attendance for the last five years, and also the attendance on public holidays, will be found below. The total number of visitors to the Museum since its opening on 22nd June, 1857, up to the end of 1901 has been 39,671,747.

ART MUSEUM AND LIBRARY.

The number of objects acquired for the Art Museum by purchase, gift, or bequest was 1661,* of which 53* were for the Indian Section. The following list gives the principal acquisitions made in the various sections during the year 1901 and also the chief loans for the same period.

I.—Sculpture and Mosaics.

By gift:—

A collection of Egyptian Antiquities, including sculptor's trial-pieces, and ivory-carvings; given by the Committee of the Egypt Exploration Fund.

Four stone statues of saints, and one of marble. French; second half of 14th century: two carved key-stones with masks in the style of Philibert de Lorme; middle of 16th century: a Venetian stone bracket of the end of the 15th century: a stone capital, carved with angels. French; 15th century: an escutcheon of carved marble; 17th century; given by J. H. Fitzhenry, Esq.

* These figures do not include the collection transferred from the Geological Museum, Jermyn Street (Nos. 1662 to 5681—1901, and 54 to 92—1901, I.S.).

6040. Wt. 7669. 2,000—8/02. Wy. & S. 597r. A

The following were the principal loans to this section during the year:—

A carved marble frieze; Italian; 16th century; two groups of the Virgin and Child; French; 14th century; a hone-stone panel carved in relief with an allegory of the Virtues and Vices by Hans Dollinger; dated 1522; and a collection of carved ivories; lent by J. Pierpont Morgan, Esq.

A marble statuette from the unfinished tomb of Gaston de Foix by Bambaja, and other works in terra-cotta and stucco; lent by Sir J. C. Robinson, C.B., F.S.A.

Various statuettes and reliefs in marble, terra-cotta and ivory, including a large carved ivory diptych (French; 14th century.) Lent by J. H. Fitzhenry, Esq.

II.—Textile Fabrics, Embroideries and Lace.

By purchase:—

	£	s.	d.
Embroidered velvet Cope; English; about 1500	129	10	8
Collection of Chinese Costumes and embroideries	128	0	0
Satin Altar Frontal and Italian brocaded damask Chasuble with embroidered English orphreys of the 14th and early 16th centuries - - -	117	6	11
Appliqué and embroidered satin Hanging; Venetian; 16th century - - - - - -	100	0	0
Embroidered satin Coverlet; Elizabethan period	80	0	0
Woollen pile Carpet; Spanish; 17th century -	79	9	10
Set of Vestments, &c., of a Roman Catholic priest, for sacramental use. Found at Abbey Dore, Hertfordshire - - - - - - - -	60	0	0
Fragments of the Vestment of Bishop Walter de Cantelupe, buried in Worcester Cathedral in 1266 - - - - - - - - - -	35	0	0

By gift:—

A panel of Tapestry; early 18th century; given by Messrs. Duveen.

A portrait in worsteds of King George III., worked by Mrs. Knowles; given by Miss M. Reynolds.

The following were the principal loans to this section during the year:—

Velvet State Robe, lined with ermine, worn by George II.; lent by H. M. the King.

A large Tapestry of the 15th century; lent by His Grace the Duke of Devonshire, K.G.

Collection of ladies and gentlemen's Costumes of the 18th century; lent by Lady Du Cane.

Imperial brocade Hangings, said to have come from the Palace of the Dowager Empress of China; lent by Humphrey B. Kendrick, Esq.

Embroidered satin Coverlet. Probably worked at Manila, Philippine Islands; lent by Miss G. Roots.

III.—Woodwork, Furniture, Musical Instruments, and Leatherwork.

By purchase :—

	£	s.	d.
A collection of French woodwork of the 15th and 16th centuries	250	17	4
An oak Screen from a synagogue ; Dutch ; late 17th century	30	0	0
A collection of European furniture and architectural details of various dates	124	14	11
A collection of Japanese lacquerwork	241	8	6
A collection of North Italian panels, of the late 15th century, painted with portrait busts and heraldic devices ; from the cornice of a room	300	0	0

By gift :—

A "Boule" Commode, a Commode of the period of Louis XV., and a Secrétaire in the style of Louis XVI. ; bequeathed by Mrs. Julia Anne Bonnor.

Four pieces of English furniture of the time of Charles II. ; given by Sir Samuel Montagu, Bart.

A 17th century Cabinet, five other pieces of furniture, and a collection of civic objects ; given by Sir E. Durning-Lawrence, Bart., M.P.

A group of Hercules carrying off Deianira from Achelous ; 16th century work of the school of Giovanni da Bologna ; given by Sir T. D. Gibson-Carmichael, Bart.

The following were the principal loans to this section during the year :—

A large group of the Virgin and Child ; Flemish ; second half of 17th century ; lent by H. Thomson Lyon, Esq.

A collection of musical instruments of the 16th and 17th centuries ; lent by George Donaldson, Esq.

A North-German cabinet of the 17th century ; lent by R. F. W. Brandt, Esq.

A collection of caskets, panels and other carvings ; lent by J. H. Fitzhenry, Esq.

A collection of Egyptian shoes and Persian boots and Saracenic panels ; lent by Dudley B. Myers, Esq.

IV.—Keramics, Glass and Enamels.

By purchase :—

	£	s	d.
A pair of English enamelled brass fire-dogs ; 17th century	308	14	0
Two Saracenic glass bottles ; 14th century	79	17	11
A Turkish pulpit-tile ; 16th or 17th century	100	0	0
A collection of early Italian pottery and fragments of earthenware, chiefly found during excavations in Florence	90	2	1

By gift :—

A collection of antique pottery, glass and terra-cotta from Cyprus; bequeathed by H. S. Ashbee, Esq.
Twenty-four plates of Chantilly porcelain ; given by J. H. Fitzhenry, Esq.
A Venetian glass chandelier, 17th century ; given by A. Casella, Esq.

The following were the principal loans to this section during the year :—

A collection of Italian, French, and Hispano-Moresque wares, Chinese porcelain, Saracenic and Venetian glass, and Limoges and Italian enamels ; lent by J. Pierpont Morgan, Esq.
Additions to the collections of pottery, porcelain and enamels ; lent by George Salting, Esq.
Additions to the collections of pottery, porcelain, glass and enamels ; lent by J. H. Fitzhenry, Esq.
Additions to the collections of Italian maiolica and Hispano-Moresque earthenware, and fragments of earthenware from Egypt ; lent by Henry Wallis, Esq.

V.—Metal Work, Coins and Medals, Arms and Armour, Silversmiths' Work, Jewellery and Goldsmiths' Work.

By purchase :—	£	s.	d.
A Venetian dagger (*cinquedea*) ; late 15th century	55	0	0
Various objects of ironwork, pewter, brasswork, etc.	208	10	10
Japanese bronzes and metalwork - - -	108	3	3
An enamelled gold watch ; French ; first half of 17th century - - - - - - - -	65	0	0
A silver plaque engraved with a portrait of Queen Elizabeth by Simon Van de Pass - - -	73	0	0
A collection of iron firebacks and firedogs - -	60	0	0
A collection of modern French jewellery - -	268	7	11
A silver-gilt chalice ; German or Flemish ; 15th century - - - - - - - - -	40	0	0
A leather belt with pierced brass mounts ; German ; about 1500 - - - - - - -	45	0	0

By gift :—

Two silver cups ; English ; dated 1617 and 1621. Part of the plate of the Court Leet of St. Andrew's, Holborn ; given by T. Burchell, Esq.
Two marble and ormoulu clocks with pairs of candelabra ; French ; 19th century ; given by Sir E. Durning-Lawrence, Bart., M.P.
Ormoulu clock ; French ; period of the Empire ; bequeathed by the late J. Willson, Esq.

The following were the principal loans to this section during the year :—

A collection of bronzes, jewellery, &c. ; lent by J. Pierpont Morgan, Esq.
A collection of silversmiths' work, metalwork, &c. ; lent by Sir J. C. Robinson, C.B., F.S.A.
A collection of silver nutmeg graters ; lent by G. O. Smith, Esq.
A collection of Sheffield plate ; lent by the Viscountess Wolseley.

VI.—Reproductions.

The reproductions acquired in 1901 comprise 132 in metal and 109 in plaster. Those in metal include a collection of castings by Messrs. Liard of Paris from Renaissance medals, and the following electrotypes:—a tilting helmet, formerly in the Brocas collection, now in the Museum of Artillery, Woolwich; a selection from the silver treasure of Chaourse, now in the British Museum; gold plaques and medallions of Ashanti work; the "Alfred" jewel, and the following objects in the Museum:—a cup, a sugar bowl, a goblet and a spoon, dating from the 16th to 18th century.

The reproductions in plaster include a doorway and portion of a frieze from the Hirschvogelsaal at Nuremberg, built by Peter Flötner in 1534; a collection of shields designed by Godfrey Sykes for the decoration of the Victoria and Albert Museum; ornaments in "Adams" ware in Burslem Museum; busts of Marie Antoinette and the Princess de Lamballe in the Victoria and Albert Museum; and portions of friezes at Brympton and in Launceston Museum.

The following objects in the Museum were cast for Circulation purposes; a collection of Italian Renaissance medals; 16 wood panels; portions of a Norwegian chair; 4 objects in ivory and 4 in leather; and 8 bookcovers.

The collection of paintings bequeathed by the late Mr. Constantine Alexander Ionides, mentioned in last year's Report, has been handed over by the Executors to the Museum. The framing of the works, in accordance with the terms of the will, is in progress, and the catalogue is in course of preparation, but owing to the re-building of a portion of the galleries, it has not yet been possible to arrange the Collection for exhibition to the public.

The Collection comprises 82 oil paintings, 439 water-colour and pencil drawings, and 615 etchings and engravings. Total, 1,136 works.

Amongst forty oil paintings by French artists, the 19th century school is represented by works of Ingres, Delacroix, Rousseau, Corot, Millet, Courbet, Degas, Regamey, Lhermitte, Fantin-Latour, Legros, and others. There are twenty paintings of the Dutch and Flemish Schools, principally of the 17th century, including works by Rembrandt, Paul Potter, Teniers, Adriaen Brouwer, Ostade, Terburg, Ruysdael, Van Goyen, &c. Fourteen Italian paintings include works by Botticelli, Francesca, Paul Veronese, Guardi, Moroni, Tiepolo; and among ten paintings by English artists, are works of Bonington, Gainsborough, Constable, Crome, Rossetti, and Burne-Jones.

The drawings are chiefly by old Italian and Dutch masters, also some by modern French painters, including Millet, Daumier, Legros, and others. There is also a large number of sketches by John Flaxman, R.A.

Among the etchings there is a collection of 125 by Rembrandt, 34 by Millet, and others by Legros, Rodin, and Whistler.

During the year eight oil paintings, four of them being by W. Clarkson Stanfield, R.A., were bequeathed by the late Mrs. Julia Anne Bonnor. They were formerly the property of her father, Commander Charles Spencer Ricketts, R.N.

Sir E. Durning-Lawrence, Bart., M.P., presented twelve oil paintings and one pastel portrait. The late Mr. W. Radley Whiteley bequeathed a miniature by J. C. D. Engleheart, and the late Miss Edith James left a water-colour drawing of the Choir of St. Paul's Cathedral executed by herself.

Thirty-seven water-colour and pencil drawings and four miniatures were acquired by purchase, including "My Second Sermon" and four sketches by Sir J. E. Millais, Bart., P.R.A., and two drawings by Albert Moore.

The total number of paintings and drawings acquired during the year by gift, bequest and purchase, exclusive of the Ionides Collection, for the gallery, and for purposes of circulation to provincial schools and museums, was 65, and details of them are given below, pp. 34—38.

The following paintings have been received on loan for exhibition in the galleries:—the portrait of Lady Mansfield by George Romney and ten miniature portraits by Andrew Plimer, Bernard Lens and others, lent by the Earl Cathcart; five miniatures lent by Mrs. Edith Johnston; and three oil paintings lent by R. Du Cane, Esq.

Fifteen miniatures, painted in enamel, have been transferred from the Geological Museum, Jermyn Street.

Exhibition of Modern Illustration.

As stated in the last Report of the Board, this Exhibition was unavoidably postponed until the commencement of the year 1901. It was opened to the public on 12th January and was closed on 4th May. During that period it was visited by about 30,000 persons.

The exhibition comprised more than 2,500 typographical reproductions, and of this number about one-half were accompanied by their original drawings, besides wood-blocks, and photographs of drawings on blocks prior to their being cut. In addition specimens were exhibited showing the process of making line and half-tone process blocks; prints by the three-colour process; and examples of printing presses. Most of the leading black and white artists in England responded to the invitation, and the gaps in the Collection were filled by the loan of engravings and drawings kindly contributed by proprietors of illustrated newspapers and magazines, and by private collectors. The Board was especially indebted to the late Mr. George Murray Smith for the loan of a collection of proof engravings and original studies made by Lord Leighton for the illustrations of "Romola" which appeared in the *Cornhill Magazine*.

Specimens of Continental works from France, Germany, Sweden, Denmark, Spain, Italy and Switzerland were exhibited; also examples from the United States and Japan. Four books containing specimens of Russian illustrations were lent by the Imperial Press of St. Petersburg.

Exhibition of Photographs.

Sir J. Benjamin Stone, M.P., lent a series of photographs produced by himself consisting of historical and architectural subjects in various parts of England. To these were added some photographs of ecclesiastical buildings, half-timbered houses, studies from nature, etc., belonging to the Art Library. They were exhibited to the public from the 19th July, 1901, to the 4th February, 1902.

Dyce and Forster Collections.

The number of visits made by readers during the year was 344; the number of books and manuscripts issued was 1,360, and of prints, drawings, etc., 230. Compared with the previous year, these figures show a decrease of 101 visitors, and of 401 in the works consulted.

CIRCULATION.

The following Museums have been added to the number of those receiving collections of works of art on loan:—Aberdeen, Accrington, Alexandra Palace, Bury St. Edmunds, Mile End (Essex House), Northampton, Sheffield (High Hazels), Weston-super-Mare.

The total number of Museums now receiving collections on loan from the Board is 88, including Dublin and Edinburgh. The collections issued have been on the same lines as in former years; special collections have been lent where desired, and as far as the Museum here would allow; and in all instances, even if the collection as a whole did not illustrate the history or development of one particular branch of art, the contents of each glass case have been confined to the illustration of the artistic treatment of one material. In these matters the wishes of local committees have been complied with as far as possible, the loans varying in character according to the requirements of the locality.

Owing to robberies at various institutions, the Board have called upon the authorities of provincial Museums receiving objects on loan to insure such objects against fire and theft for the period of their absence from the Victoria and Albert Museum, on a valuation fixed by the Board: valuable original objects are only lent to such institutions as satisfy the Board that adequate provision is made for their safety both by day and night. The loan collections are also photographed before being issued, so that in the event of the loss of any object, a photographic record is at hand. There has been some delay in issuing the collections, local

committees finding difficulty in effecting the insurance of the objects: this, together with the unusual number of temporary exhibitions, and the fact that several collections which had been on loan more than three years have now been returned, will account for the decrease of the number of objects on loan at provincial Museums. Some of the curators of country Museums avail themselves regularly of the opportunity of visiting this Museum and consulting with its officers as to the nature of the collections most desirable for their respective towns, and these curators are equally desirous of meeting the wishes of the masters of Schools of Art and other educational institutions in their neighbourhood.

The Historical Collections of Water-Colour Paintings were exhibited at Brighton, Dundee, Perth, Preston, St. Albans, Sheffield, Walsall and Warrington: the Collection of Embroideries at Bradford, Carlisle, Macclesfield and Wolverhampton: the Collection of Water-colour Paintings of Pompeii by Luigi Bazzani (which has been enlarged by the addition of sixteen drawings) at Aberdeen, Belfast and Dublin.

A selection of the works which gained awards in the National Art Competition was exhibited at Leeds, Leicester, Norwich and Warrington.

His Majesty The King granted the loan of a selection of the Jubilee presents of the late Queen Victoria to the Alexandra Palace, the arrangements being carried out by the officers of the Division.

The Collection of "New Art" Furniture, Pottery, Glass, Metalwork and Jewellery, after being exhibited in the Victoria and Albert Museum, was lent to the Industrial Polytechnic Exhibition at Bingley Hall, Birmingham, after which it was sent to the Museum of Science and Art, Edinburgh: in each case a note was sent explaining the object of the collection, and the method recommended in studying the various objects.

A collection of works showing modern illustration in Black and White, after exhibition here, was sent on loan to Edinburgh and Camberwell.

Other exhibitions, to which the Board contributed during the year, were at Carpenters' Hall, London, "to illustrate the arts of joining or carving which will be instructive and serve as examples to Craftsmen;" at Hampstead, "an experiment to ascertain whether a permanent Art Gallery would be likely to be successful"; at Lewes, "an exhibition of Sussex ironwork"; at Whitechapel, "to illustrate Chinese life, manners and customs." An important collection of Works of Art was lent to the International Exhibition, Glasgow, for which the Board received the official thanks of the Corporation.

The loans to Schools of Art and Art Classes again show a satisfactory increase, and it has severely taxed the resources of the Division to meet the many demands: the value of the decision to place before students examples, either originals or reproductions, of artistic design as applied to the various industries, has been conclusively proved; and the fact that the available examples are still insufficient to meet all the applications received shows an intelligent appreciation of the usefulness of these loans on the part of the teachers.

During the year, coloured reproductions were made of Italian medals, wood carvings and bookbindings; drawings of stained and painted glass, tiles and textile fabrics were added to the loan collections, together with autotypes of woven and printed fabrics; reproductions were made of figure studies by Alfred Stevens, and sets of photographs of Roman lettering taken from objects in the Museum were prepared in order to assist students in their preparation for the Board's Examinations. Some important works on architecture, anatomy and ornament have been added to the library. The collection of lantern slides has been more extensively used than in any previous year.

No less than 192 visits to the division were made by curators of Museums and masters of schools who desired to consult with the officers of the division and to acquaint themselves with the examples available for loan.

The total number of works of art on loan at Museums during the year was 26,149, a decrease of 2,953 on the previous year.

The number of objects lent to Exhibitions was 2,296, an increase of 832 on the previous year.

The total number of works of art on loan during the year was 44,879.

The number of objects lent to Schools of Art and Art Classes was 14,880, as compared with 13,945 in 1900.

The details of the grants in aid to Provincial Museums, amounting to £607 4*s.* 9*d.* in all, will be found on page 51.

ART LIBRARY.

The attendance of readers in the library during 1901 has numbered 15,591; and there have been, in addition, 1,300 attendances of students in the reading room in the Royal College of Art. The total number (16,891) is less than in either of the 4 previous years. The decrease is due to the library being used less than formerly by Royal College of Art students, though they now have—as explained in last year's report—a temporary reading room of their own in the College.

New acquisitions for all sections of the library have been as in previous years set out in the reading room for the information of visitors, and collections of drawings and photographs have continued to be exhibited in the Museum. Loans of books, bindings, prints, drawings and photographs have also been made through the Circulation Division to outside institutions. To some of the more important of these loans further reference will be made below.

In the section of Books the cataloguing of accessions is complete to the end of the year, and some revision of old work has been carried out. Altogether, 5,616 slips have been printed and inserted in the new card catalogue during the year, and a large amount of material has been accumulated for Class lists. The list of books on Heraldry has been published, and Mr. J. W. Bradley's Historical Introduction to the Illuminated letters and borders in the library has also appeared. A manuscript index (of owners' names) to the series of priced catalogues of sales at Messrs. Christie's is almost completed. It contains 4,385 entries. Good progress has been made with binding, but many books on the shelves still need to be dealt with. Buckram has been increasingly used for binding text-books and other works of slight intrinsic value, and it seems a satisfactory material for the covers of such books.

In the section of Prints and Drawings registration is complete to the end of 1901, and all acquisitions have been catalogued and indexed. During the year 20,012 catalogue and index slips have been written, including those for new acquisitions. 3,667 prints and drawings have been mounted, besides 1,738 designs and 1,094 specimens of textiles belonging to the collection given by Mrs. Cornuaud in 1900. Among loans made during the year from this section the most important have been the delivery of the Dalton Bequest temporarily to the Leicester School of Art, as desired by the testatrix, and the contribution of a number of Chinese drawings to a loan Exhibition of Chinese Art at the Whitechapel Art Gallery. The whole of the Dalton Bequest was catalogued and supplied with printed labels. Over 9,500 entries for a topographical index were sent to press in March, 1901, but as the first proof has not been completely delivered by the end of the year, it is not yet available for the use of readers. A catalogue of Japanese Surimono is also in the printers' hands. Professor R. K. Douglas has supplied the translations necessary for a catalogue of the Chinese Drawings and Prints in the library, and this, as well as a complete catalogue of Japanese Books and Prints, will be sent to the printers during 1902. Considerable progress has been made with a catalogue of modern French etchings, and this collection will soon be completely classified and available for use. The close of the year has been marked by the receipt of a valuable gift, from Mr. and Mrs. F. M. Paget, of 395 drawings of theatrical scenery, made for Charles Kean, F.S.A., as a record of plays produced by him at the Princess's Theatre, 1851–1859.

In the section of Photographs current registration is complete to the end of the year, and all acquisitions have been classified, labelled, mounted (when necessary), and sorted into the collection. The total number of photographs labelled, including new acquisitions, is 9,489, and the titles of all these have been inserted in the new Register. Altogether 8,538 index slips have been written and revised. Some have been already printed; the rest have been sorted so as to be available for reference until the classes are completed to which they respectively belong. The class list of "Photographic studies for painting and drawing" has been printed. That of "Mosaics" is in type and has been revised, but it is not yet out of the printers' hands. Good progress has been made with the indexes to other classes and one (Portrait photographs) is almost ready for printing. Photographs to the number of 302 were lent from the Art Library collection, for exhibition with Sir Benjamin Stone's photographs, in the galleries of the Indian Section, in 1901.

A comparative return is annexed showing the extent to which the library reading rooms have been used during the past 5 years, with other statistics and lists of the more important acquisitions of 1901.

(1.) READING ROOM RETURNS, 1897–1901.

——	1897.	1898.	1899.	1900.	1901.
Attendances of Readers	22,068	23,566	23,908	21,794	16,891
Works consulted -	39,410	37,079	41,667	37,918	32,500
Permissions for use of Water-colours.	569	763	724	585	318

(2.) ACQUISITIONS, 1901.

——	Volumes.	Parts, Pamphlets, &c.	Manuscripts.	Drawings.	Prints.	Photographs.
Purchased -	1,656	250	—	1,034	833	1,647
Presented -	419	287	1	685	282	134

1,400 Official Photographs were also received.

(3.) CIRCULATION, &c., 1901.

——	Volumes.	Drawings.	Prints.	Photographs.
Transferred to Circulation -	43	3	—	81
Lent to Circulation, to other Divisions, or to Students.	803	512	540	1,321

Purchases, 1901.

Among old books acquired by purchase during the year, may be mentioned:—

Two lace pattern books of the 16th cent., viz., Le pompe. Opera nova, nella quale si ritrovano varie e diverse sorte di mostre, 1559; and Gioiello della corona per le nobili e virtuose donne. Fiorenza, 1596.

Five old writing books, viz., Vicentino, Regola da imparare scrivere. Venetia, 1533; Hercolani, Lo scrittor' utile. Bologna, 1574; Conretto, Modo d'imparar' a scrivere. Venetia, 1576; Periccioli, Il secondo libro delle cancellaresche. Siena, 1610; and Daniel's Copy-book. London, 1664.

Three heraldic works of the 16th and 17th cent., viz., Bara, Le blason des armoiries. Cuts. Lyons, 1581; La Roque, Les blasons des armes de Bourbon. Engr. by P. Firens, incl. plates of ornament as tail-pieces, etc. Paris, 1626; and Chevillard, La France chrétienne. Engr. Paris (1693).

The Grete Herbal. Southwarke, 1526.

Rusius, Hippiatria. Cuts (of horses' bits, etc.). Lutetiae, 1532.

Designs for travelling coaches. Webley, Holborn, 1763.

Babington, Pyrotechnia. London, 1635.

The plan of an Academy for the better cultivation ... of Painting, etc, London, 1755.

Facsimile of Sketch-book of Inigo Jones. (London, 1832?).

Julien, Album de reliures artistiques et historiques. Paris, 1869–72.

Dufour, Collection des anciennes descriptions de Paris. Paris, 1878–83.

Berlin: Reichsdruckerei. Druckschriften des 15.-18. Jahrh. Berlin, 1884–87.

The following series were acquired:—

L'Architecture. Journal de la Société centrale des Architects français 1888 et seq.

Journal of the Architectural and Archæological Society for Chester 1857 et seq.

Proceedings of the Oxford Architectural and Historical Society. 1860 et seq.

Transactions of the East Riding Antiquarian Society. 1893 et seq.

Quarterly Journal of the Berks Architectural and Archæological Society, 1889–95.

Ars Quatuor Coronatorum, being the transactions of the Lodge Quatuor Coronati. 1888–96.

Kate Greenaway, Almanacks, 1883–95.

Almanack du Bibliophile. 1898–1900.

Genealogical Magazine. 1897 et seq.

A collection of volumes of English illustrated magazines, 1859–78.

As in 1900, few old books were bought, almost all the money available being required for current art publications. These were so numerous that it is impossible to give in this report, even a summary of the important works. Such a summary is the less necessary, as the library aims at acquiring, not a selection only of the new books on Fine and Applied Art, but a complete set of all that are of any value, both in English and, especially when illustrated, also in Foreign languages.

The following interesting acquisitions, by purchase, were made for the section of Prints and Drawings:—

A collection of proofs, some with artists' corrections, from the exhibits of Messrs. Dalziel Bros., J Swain & Son, and W. Heinemann, at the Exhibition of Modern Illustration

A collection of 234 impressions from gunsmiths' engraved ornaments of the 16th and 17th centuries.

A volume of original Lace Patterns, made for Elisabeth, Duchess of Brunswick-Luneburg, 1614.

3 series (48 plates) of lace patterns engraved by F. Danieli, c. 1640.

An Album of drawings (78ff.) by J. Glover.

Sketches of Birds by J. Wolf.

Water-colour drawing of the interior of Cripplegate Church, by J. Carter

Mezzotint by F. Short of "Love and Death," by G. F. Watts, R.A.

5 plates of ornament for gunsmiths, by M. Engelbrecht.

Ferri, Parte del treno delle Carrozze. Engr. Roma, 1691.

82 drawings, Views in Tuscany, by Sir R. C. Hoare. 1789.

A series of studies of Jewellery, from paintings in the National Gallery and National Portrait Gallery.

Additions were made to the library collections of Japanese drawings and colour prints, including some from the Bowes Museum, Liverpool. Some Chinese drawings were also acquired, including a series illustrating the manufacture of porcelain.

The following have been the most important purchases for the section of Photographs.

The following have been the most important purchases for the section of Photographs:—

160 photographs, by Messrs. A. Braun & Co., of paintings in the Musée du Louvre, Paris.

28 autotypes of paintings by Mr. Frederic Shields, in the Chapel of the Ascension, Hyde Park Place.

30 photographs of Drawings, by Ingres, in the Museum at Montauban.

45 photographs, by the Autotype Co., of Portraits shown in the Stuart Exhibition, London.

20 photogravures, by the Berlin Photographic Co., of paintings in the Musée du Luxembourg, Paris.

71 photographs of Early Christian Ivories in English Collections, published by Dr. H. Graeven.

61 photographs, by A. Brothers, of Half-timbered Houses in England.

237 photographs of Tapestries at Madrid and in the Escurial.

128 photographs: Studies of trees, plants and flowers, by Mr. H. Irving.

61 photographs: Studies of domestic animals, by Mr. Charles Reid.

46 photographs: Studies of wild animals, by Messrs. G. W. Wilson & Co.

16 photographs of the Lensart Series, and 7 large pictorial photographs by Messrs. E. Day & Son.

36 photographs of Architecture, etc., acquired from the Palestine Exploration Fund.

28 photographs; Restaurations de monuments anciens (envois de Rome).

Further parts were received of the following series, among others: Brunn, Griechische und Römische Porträts; Bode, Die Renaissance-Sculptur Toscanas; and Bode, Griechische und Römische Sculptur.

Donations, Etc, 1901.

The official photographs received included, in addition to those of objects in the Museum, series of photographs of Furniture, etc., in Hardwick Hall, Ham House and Roehampton House, and of details, etc., in St. Alban's Abbey.

The transactions of certain Societies have been presented as heretofore, and the continuations of other series.

The following include the most interesting and valuable of the other donations received :—

Armourers and Brasiers, The Master, Wardens and Court of Assistants of the Worshipful Company of
A short description of the ancient Silver Plate belonging to the Worshipful Company of Armourers and Brasiers. By H. D. Ellis. 1892.

Baertes, M. Jules
De Scalden, 2de Tentoonstelling. Monumentale, dekorative en toegepaste Kunst. Antwerp. 1898.
Tweede, derde und vierde Jaarboek der Scalden. 1898-1901. 3 vols.

Buls, Mr. C.
Croquis siamois. 1901.

Boselli, Signor A.
Pitture del secolo xvi rimasti ignoti fino ad oggi. Parma. 1900.

Boston Museum of Fine Arts, Trustees of
Catalogue of the Morse Collection of Japanese Pottery in the Museum of Fine Arts, Boston. 1901.

Brandt, Mr. R.
Arnold Böcklin. Photogravure reproductions. Series i and ii.

British Museum, Trustees of the
Catalogue of Printed Books (and Supplement). 1881–
Catalogue of the Hebrew and Samaritan MSS. By G. Margoliouth.
Part i. 1899.

Catalogue of Sculpture by A. H. Smith. Vol. ii., 1900.

Catalogue of the Greek Coins of Lycaonia, Isauria and Cilicia. By G. F. Hill. 1900.

Catalogue of the Sinhalese MSS. By Don Martino de Zilva Wickremasinghe. 1900. Facsimiles of Biblical MSS. Edited by F. G. Kenyon. 1900.
Catalogue of the Collection of Playing Cards bequeathed by the late Lady Charlotte Schreiber, 1901.

Bruce, The Misses
Riepenhausen. Peintures de Polygnote à Delphes. Rome, 1826.

Burlington Fine Arts Club, The Committee of the
Catalogue of an Exhibition of a collection of Silversmiths' Work of European origin. 1901.

Cardiff, Free Public Library, The Committee.
Quarterly Magazine. Vols. i-iii. 1897-1901.

Dawson, Mr. C., F.S.A.
The Services of the Barons of the Cinque Ports. 1901.

Devereux, The Hon. Mrs.
A volume of drawings of the Temple of Hallibede, Mysore.

Dewick, The Rev. E. S., M.A., F.S.A.
The Coronation Book of Charles V. of France (Cottonian MS.). 1899.

Edgecumbe, Sir Robert
The parentage and kinsfolk of Sir Joshua Reynolds, P.R.A. 1900.

Edinburgh, Board of Manufactures.
Catalogue of the First exhibition of the Art Manufacturers' Association, Edinburgh, 1856.

Catalogue of the Loan Exhibition of Scottish National Portraits, Edinburgh, 1884.

FITZHENRY, MR. J. H.
Collection, Charles Mannheim (afterwards J. Pierpont Morgan Collection). Objets d'Art. Catalogue redigé par M. E. Molinier. Paris, 1898.

GIBSON, MR. STRICKLAND.
Some notable Bindings preserved in Bodley's Library or Oxford. 1901.

GODMAN, MR. F. DU CANE.
The Godman Collection of Oriental and Spanish Pottery and Glass. 1901.

GRAHAM, MRS.
Waring's. Masterpieces of Industrial Art and Sculpture. 1863. 3 vols.

HART, MR. J.
Illustrated guide to the Church Congress, held at Brighton. 1901.

HAZASHI, M.
Histoire de l'Art du Japon. Paris, 1899.

INDIA OFFICE, THE
Preliminary report on a journey of archæological and typographical exploration in Chinese Turkestan. By M. A. Stein. 1901.

JACQUET, M. ACHILLE.
Proofs, on Japanese paper, of three etchings of paintings by Mantegna.

LEDIARD, MR. H. A., M.D., F.R.C.S.
On Samplers. ph. 1900.

LICHTWARK, DR. A.
Matthias Scheits als Schilderer des Hamburger Lebens, 1650—1700. 1899.
Meister Francke. 1899.
Julius Oldach. 1899.

LEGA-WEEKES, MISS E.
The ancient mansion of North Wyke. 1890.

LEWIS, PROFESSOR BUNNELL, F.S.A.
Roman Antiquities in South Germany. 1901.

LONDON COUNTY COUNCIL.
Holborn to the Strand Improvement Designs. 1900.

MORGAN, MR. J. PIERPONT.
Catalogue of the "Pfungst" Collection of Italian Bronzes, the property of J. Pierpont Morgan; with notes by Dr. Bode. 1901.

NEW YORK: THE CENTURY COMPANY.
Eighty-seven proofs of Wood-Engravings by Timothy Cole.

MORRIS, MRS.
Four sheets of the Kelmscott Chaucer.

PAGET, MRS. F. M. (niece of Mrs. Charles Kean).
A collection of water-colour drawings of Scenes and Accessories to plays produced by the late Charles Kean, F.S.A., at the Princess's Theatre, from 1850 to 1859.

PARIS EXHIBITION, 1900. BRITISH ROYAL COMMISSION.
Catalogues and other Literature issued by the Commissioners of the various countries represented at the Paris Exhibition, 1900.

PENNSYLVANIA UNIVERSITY, PHILADELPHIA, U.S.A.
Free Museum of Science and Art, Department of Archæology. Bulletin. Vol. III. 1901.

PEREIRA D'ANDRADE, SEÑOR P.
Estudos Historico-Archeologicos. 1901.

PRUYN, MRS. ANNA PARKER.
A description of the Pastoral Staff given to the Diocese of Albany, New York. 1900.

REDIN, M. E K.
Die Bedeutung der Thätigkeit der Archäologischen Congresse für die Wissenschaft der russischen Archäologie. xh. 1901.
Das Heiligenbild "Nedremannoje Oko". ph. 1901.
F. E. Betzky und das Museum der Schönen Künste und Antiquitäten der Universität Charkow. Zur Geschichte der Universität. ph. 1901.
Die antiken Götter (Planeten) in illustrierten Handschriften des Werkes Cosmas Indicopleusten. ph. 1901,

RICHTER, MRS. J. PAUL.
Siena. Von Luise M. Richter. 1901.

ROSE, MR. B. J.
Report on the Indian Section of the Paris Exhibition of 1900. 1901.

ROWLEY, & Co., MESSRS.
Forty-three autotypes of drawings by Ford Madox Brown, C. W. Cope, R.A., William Blake, Dante Gabriel Rossetti, J. F. Shields and Henry Wallis.

RUDDELL-TODD Bequest.
Illuminated MS., "The Birth and Death of our Lord Jesus Christ, according to the Gospel of St. Luke." 1879.

ST. PAUL'S ECCLESIOLOGICAL SOCIETY, THE COUNCIL OF THE
Transactions. Vol. III., parts 4 and 5. Vol. IV., parts 1 to 5.

SEILLIÈRE, BARON LÉON.
Documents pour servir à l'histoire de la Principauté de Salm et de la Ville de Senones. 1898.

SHORT, MR. FRANK, R.E.
Eight etchings, proofs of plates made for the completion of Turner's Liber Studiorum.

SOLON, MR. L.
Pottery Manufacture in Staffordshire during the last century. 1901.

SPIERS, MR. R. PHENÈ.
The Great Mosque of the Omeiyades, Damascus. 1900.
The Architecture of "Coriolanus" at the Lyceum Theatre, 1901.

STANNUS, MR. HUGH, F.R.S., B.A.
On some examples of Romanesque Architecture in North Italy. ph. 1901.

STONE, SIR J. BENJAMIN, M.P.
Two platinotype photographs of the Leather Cover of the Book of Armagh in Trinity College, Dublin.

STUTTGART: KÖNIGL. ZENTRALSTELLE FÜR GEWERBE UND HANDEL.
Katalog der Bibliothek. 1901.

THOMPSON, Mr. Henry Yates.
Facsimiles in photogravure of six pages from a Psalter in the possession of H. Yates Thompson. 1900.

TRAPNELL, Mr. Alfred.
Illustrated Catalogue of Chinese Porcelain and Pottery forming the collection of Mr. Alfred Trapnell. 1901.

WAUTERS, M. A. J.
Le Retable de Sainte-Walburge commandé en 1515 à Bernard Van Orley. 1899.

WEALE, Mr. W. H. J.
François Pellegrin, peintre et sculpteur de Fontainebleau. Par L. Dimier 1901.

SCIENCE MUSEUM AND LIBRARY.

Additions and Withdrawals.

During the year 9,048 volumes have been added to the Science Library, 759 by purchase, and 8,289 by presentation, and also 6,377 parts of Periodical publications and pamphlets, 4,262 by purchase and 2,115 by presentation. These additions consist mainly (viz.:—7,512 volumes and 1,082 parts, pamphlets, &c.) of an instalment of the portion of the Jermyn Street Museum Library, which is to be finally transferred to Science Library, in continuation of the transfers effected at various times since 1883.

The foregoing figures also include 268 volumes and 192 parts and pamphlets presented by the War Office, and a set of 71 volumes of the Zeitschrift für Bauwesen from H.M The King, the remaining gifts being chiefly contributions from Societies and Institutions received in exchange and from donors who have also presented books in former years. A list of the chief works and periodicals purchased will be found below.

Besides the above, 150 volumes have been added to the Patent Section.

933 maps have been added to the Library, all by presentation, including 479 sheets of the 1-inch Ordnance Survey Maps and 314 from the Jermyn Street Museum Library.

The books withdrawn number 624, which include the Ella Collection of Music, 329 volumes transferred to the Royal Academy of Music and 288 books on Art, received with the books from Jermyn Street, and sent to the Art Library.

Cataloguing

1,747 Catalogue titles (including cross-references) have been written and 210 revised during the year. Of these 1,015 have been received back from the printer.

The chief work of the year in this department has been the preparation of an Author Catalogue on cards, by cutting up copies of the printed Catalogue and the various Supplements of Science Library, and pasting the titles on to cards. These were checked and suitably altered where necessary and possible. The Catalogue titles of the books received from Jermyn Street, except the Periodicals, which were catalogued and the titles printed with the monthly slips, were similarly cut from copies of the Jermyn Street Library Catalogue, and placed with the rest. This Catalogue, however, contains no titles for books received after 1878, so that a considerable number are at present uncatalogued. These are being done gradually, month by month, together with the current additions to the Science Library. The books received from the War Office have nearly all been catalogued and absorbed into the Library. The Author Catalogue contains 18,122 cards, including the Catalogue titles printed during the year, and additions are made monthly, as the slips are received from the printer.

In addition to the large Author Catalogue on cards, a Subject Index of recent additions to the Library has been provided for the use of readers. This is intended to enable readers to find out what has recently been added to the Library, and serves as a guide to new books on Science. The Index covers a period of 12 months. Titles of new books are added in MS. as soon as received, in order to avoid the delay caused by waiting for the printed slips. 311 such cards have been specially written for the Index during the year.

Arrangement. A Subject Catalogue of the whole Library will be gradually prepared as the new scheme of classification and press-marking of the books is taken up. This new scheme will be proceeded with as soon as the transfer of books from Jermyn Street and their incorporation in the Science Library is complete.

A large proportion of the books on the shelves of the Library viz., nearly all the works on Pure and Applied Science, has been checked, and misplaced books put in their proper places. The result of the checking, which is still proceeding, is now being examined. Readers have now been definitely excluded from access to the shelves, except under special conditions, and no book is removed from its place without a requisition being substituted, showing where it is. All the series of Periodicals received from Jermyn Street have been incorporated into their proper places in the Library. The other books received from Jermyn Street are, of necessity, arranged by themselves for the present.

Binding. The binding of completed volumes of Periodicals and other work has fallen somewhat into arrear, owing to the necessity for calling off the Attendants in charge of the preparation of the volumes to superintend the incorporation of the large number of books from Jermyn Street on the shelves, but 852 volumes have been prepared for binding, and of these 769 have been returned from binders, collated and replaced in their proper places. Also 13 volumes have been repaired. In addition 233 volumes of the more important acquisitions to the Library have been specially collated before Registration.

Attendance. During the year 11,986 readers have visited the Library and 319 persons examined specifications in the Patent Section, making a total of 12,305 readers. This shows a decrease of 1,191 upon the number for the preceding year. Besides the books requisitioned by readers in the Reading Room, 2,417 have been supplied on loan to the Professors of the Royal College of Science, and 499 to officers on the Staff of the Board, principally Museum Officers for official reference.

The following table shows the number of readers in the Library during the past five years:—

Year.	School Teachers, &c.	Students in Dept. Schools.	Consulters of Patent Specifications.	Other Readers.	Total.
1897 - -	1,882	9,253	502	3,888	15,525
1898 - -	2,219	9,695	518	3,674	16,106
1899 - -	1,881	8,192	293	3,728	14,094
1900 - -	2,022	7,368	343	3,763	13,496
1901 - -	1,854	6,413	319	3,719	12,305

Among the more important books purchased the following may be noted:—

Bach, C. Élements des Machines. 2 vols. 8vo. Paris, 1901.
Berthelot, M. Les Carbures d'Hydrogène, 1851–1901. 3 vols. 8vo. Paris, 1901.
Blondel, A., and Paul-Dubois, F. Traction Électrique sur voies ferrées. 2 vols. 8vo. Paris, 1901.
British Association Catalogue of Stars. 4to. London, 1845.
Fischer, E., and Guth, M. Der Neubau des ersten chemischen Instituts zu Berlin. 4to. Berlin, 1901
Gauss, C. F. Werke. Vols. 1–6, and 8. 4to. Göttingen, 1870–1900.
Hassall, A. H. History of the British Freshwater Algae. 2 vols. 8vo. London, 1845.
Heddle, M. F. Mineralogy of Scotland. 2 vols. 8vo. Edinburgh, 1901.
Koelliker, A. von. Festschrift. Zur Feier seines fünfzigjahrigen mediscinischen Doktorjubiläums. 4to. Leipzig, 1892.
Madsen, A. P., Müller, S., &c. Affalsdynger fra Stenaldeen ir Danmark. 4to. Kjøenhavn, 1900.
Merzbacher, G. Aus den Hochregionen des Kaukasus. 2 vols. 8vo. Leipzig, 1901.
Pingrè, A. G. Annales Célestes du 17. Siècle. 4to. Paris, 1901.
Sowerby, J. English Botany. 3rd edition. 13 vols. 4to. London, 1877–99.
Wallach, O. Briefwechsel zwischen Berzelius und Wöhler. 2 vols. 8vo. Leipzig, 1901.

The following periodicals have also been added to the Library by purchase:—

American Journal of Physiology. Vol. 1 and onwards. Boston, 1898, &c.
Annals of the Astronomical Observatory of Harvard College. Vol. 1 and onwards. Cambridge, Mass., 1856, &c.
Biometrika. Vol. 1 and onwards. Cambridge, 1901, &c.
Gazzetta Chimica Italiana. Vol. 1 and onwards. Palermo, 1871, &c.
Journal of Comparative Neurology. Vol. 1 and onwards. Granville, Ohio, 1891, &c.
L'Enseignement Mathématique. Revue internationale. Vol. 1 and onwards. Paris, 1899, &c.
Naturæ Novitates. Vol. 1 and onwards. Berlin, 1879, &c.
Sammlung chemischer und chemischtechnischer Vorträge. Vol. 1 and onwards. Stuttgart, 1896, &c.
Verhandlungen der Deutschen Zoologischen Gesellschaft. 1te Jahresversammlung, &c. Leipzig, 1891, &c.

The most important donations during the year include:—

71 vols. of the Zeitschrift für Bauwesen. Presented by H.M. The King.
479 Maps of Great Britain and Ireland on the 1-inch scale from the Ordnance Survey.

MACHINERY AND INVENTIONS DIVISION.

During the year 1901 the collection in this division has been increased by the addition of 77 models or examples and 48 diagrams, pamphlets, &c. One object has been withdrawn and three have been exchanged by their owners. Amongst the more interesting of the additions may be mentioned:—

Series of early cycles, showing the development of the bicycle. Presented by various cycle manufacturers.

Model of the installation at Woolwich for testing mining explosives. Presented by the Home Office.

Shaw's apparatus for estimating the amount of explosive gases in mine air. Purchased.

Winding or spooling frame. Presented by Messrs. Robert Broadbent & Son.

Models of McCormick's reaping machines of 1831, 1845, and 1851. Presented by the McCormick Harvesting Machine Company.

Model of wheel-moulding machine. Lent by Messrs. W. Whittaker & Sons.

Model of two-stage expansion Willans' central-valve engine directly driving a Crompton dynamo. Lent by Messrs. Willans & Robinson, Limited.

Model of three-stage expansion rotative pumping engine at Hastings Waterworks. Lent by Messrs. Tangyes, Limited.

Model of express passenger locomotive "Claud Hamilton." Lent by the Great Eastern Railway Co.

Sectional model of Morton's ejector condenser. Lent by Messrs. A. F. Craig & Co.

Model of single cell refuse destructor. Lent by the Horsfall Destructor Co.

Sectional example of a pneumatic hammer and of a drill motor. Lent by the International Pneumatic Tool Co.

A small "Sirocco" centrifugal fan. Lent by Messrs. Davidson & Co.

Models of pressed steel carriage and wagon bogies. Lent by the Leeds Forge Co.

Models of Blake's vertical boiler. Lent by Messrs. Richardsons, Westgarth & Co.

In the workshop attached to the Machinery and Naval Divisions, besides the regular work of repairing and cleaning models and adapting them for exhibition, a sectional model of Watt's wagon boiler, complete with its setting and fittings, has been made; also a working sectional model of Gooch's link motion, and a construction model of the stern of a cruiser provided with double rudders worked by Harfield's compensating steering gear.

The number of models in the Southern Galleries now shown in motion, or so arranged that they can be worked by the public, is 155, representing a net increase of 7 during the year; of the total number thus exhibited 69 relate to marine engineering.

A revised and enlarged edition of Part I. of the Descriptive Catalogue has been on sale since July, and the rearrangement of the collection, together with the re-numbering of the labels necessitated thereby, has since been completed; in addition, 180 descriptive labels have been prepared for printing. Several drawings and diagrams, including a sheet of the early locomotives used on the Stockton and Darlington Railway, have been prepared for the collection.

The work of photographing the more important objects in the collection has been temporarily suspended, owing to pressure of other work consequent upon the absence of one of the staff as a volunteer in South Africa.

NAVAL AND MARINE ENGINEERING DIVISION.

During the year 1901 this collection has been increased by the addition of 23 objects. One model has been exchanged, and 11 models and 3 pictures have been withdrawn by their owners, while 5 objects have been lent to local museums. Of the acquisitions the following are the more important :—

Rigged whole model of s.s. "Hibernia." Presented by the London and North Western Railway Co.
Rigged whole models of H.M.S. "Magicienne" and s.s. "Arizona." Lent by the Fairfield Shipbuilding and Engineering Co.
Rigged whole model of s.s. "Belgia." Lent by Palmer's Shipbuilding and Iron Co.
Rigged whole model of s.s. "Syria." Lent by the Peninsular and Oriental Steam Navigation Co.
Built whole model of s. "Vimeira" (1850). Lent by Sir James Laing & Sons.
Whole model of East Indiaman "Seringapatam" (1837). Lent by Messrs. R. & H. Green, Ltd.
Models of gunboats, and of the engines of H.M.S. "Hero." Lent by G. B. Rennie, Esq.
Half block model of s.s. "Kamakara Maru." Lent by the Nippon Yusen Kaisha.
Model of Harfield's compensating steering gear, as fitted in H.M.S. "Gladiator." Made in the Museum Workshop from drawings supplied by Messrs. Harfield & Co.

A built whole model of a 64-gun ship of the year 1750, and a whole block model of s.s. "Great Eastern" have been completed and rigged in the Museum.

BUCKLAND FISH COLLECTION.

The usual hatching of salmonidæ has been continued and the fry distributed, while the selection of living specimens of various ages has been maintained. A certain amount of compression has again been necessary, owing to the building operations in connection with the extension of the Royal College of Science.

COLLECTIONS FOR SCIENTIFIC INSTRUCTION AND RESEARCH.

The following return shows the number of visitors to the Western Galleries during the last five years.

Year.	Visitors.	Visitors receiving Special Assistance or facilities for examination of Models and Apparatus.	Classes attending with their teachers.
1897	102,352	3,694	173
1898	108,272	4,004	193
1899	98,739	5,214	226
1900	87,356	5,031	242
1901	89,189	3,738	203

The changes made in the arrangement of the objects in the Galleries have been few and mainly confined to the Geological Section. During the year many of the models and specimens for illustrating instruction in Geology and Metallurgy have been transferred from the Museum of Practical Geology, Jermyn Street.

Considerable labour has been expended in attempts, generally successful, to discover particulars concerning many of the old instruments exhibited in the mathematical and physical sections of the collections; as a result of which the number of these objects which have descriptive labels attached to them has been largely increased.

A revised and greatly extended Catalogue of the Physics Collection is nearing completion; while another Catalogue, embracing Mathematics and Standards of Measurement, is in course of preparation.

A wall case is in course of erection in the Upper Gallery, to accommodate the apparatus for Advanced Physiology now being acquired to meet the wants of the classes visiting the Museum.

A new set of models has been selected to illustrate instruction in Steam. This will shortly be ready for issue on loan to Schools.

The loans of apparatus, models, and diagrams to the Professors of the Royal College of Science for lecture purposes and laboratory work numbered 729.

In Science Circulation 33 sets of apparatus, comprising 1,066 objects, were issued on loan to 20 Science Schools and Classes. The following table shows how these numbers compare with those of former years:—

Year.	Number of sets of apparatus circulated.	Number of objects in the sets.
1897 - - - - -	52	2,601
1898 - - - - -	64	3,118
1899 - - - - -	52	2,670
1900 - - - - -	57	2,473
1901 - - - - -	33	1,066

It will be seen that the number of sets of apparatus circulated in 1901 shows a marked falling off as compared with the numbers circulated in previous years. This probably arises from the fact that the Schools and Classes which have hitherto made applications for loans are to a greater and greater extent acquiring the apparatus and instruments necessary for illustration and experiment.

The acquisitions during the year 1901 were as follows:—

How Obtained.	Microscope Slides, Lantern Slides, and Specimens.	Models and Instruments.	Maps, Diagrams, and Photographs.	Total.
Purchased - -	—	18	20	38
Presented - -	172	34	42	248
Lent - - -	2	11	26	39
	174	63	88	325

The more important of these additions comprise:—

Mathematics and Measurement:—

1. Chronometer with resilient lever escapement. Designed and bequeathed by W. G. Schoof.
2. Watch with duplex escapement, 1830. Given by Sir E. Durning-Lawrence, Bart.
3. Cardboard models (16) of surfaces of the second order. Given by Dr. A. Brill.
4. Ellipsograph, formerly the property of the late Jas. Nasmyth. Lent by W. Shackleton.

Physics:—

1. (*a*) Cuthbertson's balance-discharger. (*b*) Aurora tube. From C. A. Wells.
2. Apparatus for measuring the velocity of the cathode rays. Lent by Prof. J. J. Thomson, F.R.S.
3. Circuit, mirror and suspension for Boys' radio-micrometer. Lent by the Cambridge Scientific Instrument Co.
4. Minchin's absolute electrometer. From the Physical Laboratory, Royal College of Science.
5. Photoglyphic engravings (4) by the late H. Fox Talbot, F.R.S., with their etched metal plates. Given by C. H. Talbot.

Chemistry:—

1. Wollaston's synoptic table of chemical equivalents. Given by C. A. Wells.
2. Sir Humphry Davy's apparatus for the electrolysis of potash. From C. A. Wells.
3. Specimen of re-sublimed iodine. Lent by the British Chemical Co., Clydebank.

Metallurgy:—

1. Specimens of iron and other metals, illustrating Indian metallurgical processes. From the Museum of Practical Geology, Jermyn Street.
2. Models of gold-melting and assaying furnaces. Given by the Morgan Crucible Co.

Geology and Mineralogy:—

1. Theodolite-Goniometer (Czapski Model). From R. Fuess.
2. Petrological microscope for advanced work. Made by Ross & Co.
3. Pisani's larger apparatus for determining specific gravities by displacement. From the Geological Laboratory, Royal College of Science.

4. Balance and set of weights for determining the specific gravities of rocks and minerals. Lent by W. & J. George & Co.

5. Models (13) designed about 1840 by T. Sopwith to illustrate various geological phenomena. From the Museum of Practical Geology, Jermyn Street.

6. Models (8) by Prof. L. Duparc, to illustrate instruction in tectonic geology. From Dr. Krantz.

7. Contoured models:—(*a*) Purbeck Island. (*b*) The Thames Valley. (*c*) The South-East of England. From J. B. Jordan.

8. Model of Mont Blanc, geologically coloured. From the Museum of Practical Geology, Jermyn Street.

9. Model of the Chain of Puys, Auvergne. From the Museum of Practical Geology, Jermyn Street.

10. Photographs (24) showing bands, &c., produced by the passage of polarized light through thin sections of crystals. Given by W. B. Croft.

11. Woodward's Table of British Strata. From Dulau & Co.

12. Coloured diagram showing "blood rain" which fell in Calabria in 1813. From the Geological Laboratory, Royal College of Science.

Biology:—

1. (*a*) Godwin's form of respiroscope. (*b*) Constant pressure injection apparatus. From H. Burgess.

2. Botanical diagrams by A. Peter. From Williams and Norgate.

Physiography:—

1. Diagrams (11) illustrating the magnetic survey of the United Kingdom by Professors Rücker and Thorpe. Lent by Prof. Rücker, F.R.S.

2. Ordnance maps (2) of Reigate and district, one coloured, the other with hills in brown. From the Geological Laboratory, Royal College of Science.

3. Douglas's reflecting protractor. From Mrs. L. M. Robottom.

4. Photographs:—(*a*) Star spectra (4). (*b*) Metallic spectra showing enhanced lines. (*c*) Illustrations (7) of the total solar eclipse, Viziadrug, India, 1898. Lent by Sir J. Norman Lockyer, F.R.S.

5. Photograph of an exploding meteor. Lent by C. P. Butler.

6. Sun-dial by Johann Martin, of Augsburg. From Behr and Fink (through Art Museum).

The withdrawals during the year 1901 were the following:—

1. Star spectroscope by Merz. Lent for the use of the British Antarctic Expedition.

2. Stückrath's pendulums for relative gravity measurements. Lent for the use of the British Antarctic Expedition.

3. Old form of astronomical clock. Lent by Lear Drew.

4. Diagrams (5) illustrating the Mond process for the extraction of nickel. Lent by the Institute of Civil Engineers.

HEATING AND LIGHTING OF THE MUSEUM.

The following is an abstract of the records for the year of the temperature in certain parts of the Museum and out of doors:—

	Diurnal Variation.		Temperature.		
	Max.	Mean.	Min.	Mean.	Max.
	°	°	°	°	°
Jones Bequest Gallery	10	3·4	48	60·7	78
New Sheepshanks Gallery	9	2·8	54	63·3	79
Raphael Gallery	8	3·0	53	63·2	80
Water Colour Gallery	9	4·0	45	61·7	80
Italian Court (Centre)	7	3·5	54	63·1	76
Lord Presidents' Court (East)	6	2·9	53	62·0	76
South-east Court	5	1·8	54	62·4	75
On the Screen (out of doors)	25	11·9	26	52·2	89

During the time (nearly eight months) when the Museum was artificially heated, the mean temperature of the interior was 60·4; that of the open air was 46·1.

The electric lighting of the Cloisters at the side of the Courts of the Art Museum, mentioned in last year's Report, has now been completed, except in those parts affected by the alterations to the buildings now in progress.

The cost of electric current in the whole of the building was £2,419, that of carbons for arc lamps and of renewals of glow lamps was £100; that of gas £2,070.

BRANCH MUSEUM, BETHNAL GREEN.

The number of visitors during the year was 489,052, a decrease of 17,196 as compared with the previous year, but 48,135 more than in 1899. There were 258,324 visitors during the daytime, 145,703 during the evenings, and 85,025 on Sundays. The average weekday attendance was 1,307; on Sundays, 1,635. The greatest number of visitors on any one day was 7,449 on Easter Monday; the least number was 107 on July 12th. Comparative tables shewing the monthly and yearly attendance for the last five years will be found below.

Art Collections.—The Willett Collection of Pottery which had been exhibited here for two years was removed in May to the Alexandra Palace.

A Collection, consisting of arms, armour, etc. presented to H.R.H. the Duke of Saxe-Coburg during his tour in the *Galatea*, 1867-71, and of gold and silver trowels, caskets, trophies, etc., presented to the late Duke of Saxe-Coburg on the occasions of the public functions which he attended, was lent for exhibition by H.M. The King, from 3rd June till 18th August, when the arms and armour were returned to Windsor Castle, but the rest of the collection still remains.

A Bell weighing 6 cwts. with canopy, bequeathed by the late Rev. H. R. Haweis, M.A., to the Victoria and Albert Museum, was received on 13th August, and the Collection of British Pottery and Porcelain from the Museum of Practical Geology, Jermyn Street, during November and December.

Food Collection.—Samples of water from several sources in the neighbourhood were obtained every month and tested for organic impurities. Statistical labels were revised. The models of vegetables removed the previous year were returned, renovated, with about 20 new models, by Messrs. Sutton & Sons, of Reading. Mr. W. Crockford, of Messrs. Charrington's firm, obtained a series of specimens of malt and hops of various countries which were placed in the case in which the brewing and analysis of beer are illustrated.

Animal Products Collection.—52 examples of footgear, chiefly Indian, were removed by the Circulation Division for loan to the Museum at Northampton, where a Collection of Boots and Shoes on the lines of that exhibited here in 1897 has been begun. The Chairman of the Committee of Management of the Northampton Museum had previously visited this Museum to obtain particulars concerning the Collection of 1897, and was given all possible assistance in forming his own Collection.

Doubleday Collection of Lepidoptera.—There were 148 visitors during the year.

Visits to the Museum were made by 42 Board Schools.

Lectures on the Food Collection were given by Dr. Tilley and Mr. Edwards. 9,831 persons were seen sketching and taking notes; these figures are given by the police.

Permissions to copy pictures and water-colour drawings were issued to 93 Art Students, an increase of 38 as compared with 1900.

RETURNS OF ATTENDANCES AND RECEIPTS.

(*a*) *Victoria and Albert Museum.*

(1.) RETURN of MONTHLY ATTENDANCE of VISITORS

1901.	FREE DAYS.		Students' Days.	Sundays.	TOTALS.	Corresponding Totals in			
	Morning.	Evening.				1900.	1899.	1898.	1897.
January -	33,984	10,646	17,277	4,115	66,022	72,698	88,864	81,495	85,531
February -	23,498	8,359	10,633	6,629	49,119	49,924	65,781	65,833	71,253
March - -	31,025	10,889	14,133	13,187	69,239	59,664	70,332	72,033	82,973
April - -	67,584	14,644	11,879	9,687	103,794	93,010	113,501	103,466	119,825
May - -	34,074	9,336	12,908	7,781	64,099	57,820	104,833	87,639	73,642
June - -	25,290	8,612	14,238	9,996	58,136	71,370	57,913	73,942	78,906
July - -	32,603	11,174	19,810	8,159	71,746	62,170	74,221	79,563	80,306
August - -	46,929	14,019	29,891	8,933	99,772	107,260	112,144	117,426	118,753
September -	31,799	11,095	16,252	12,142	71,288	73,580	77,916	72,245	82,812
October - -	30,460	9,860	15,785	7,121	63,226	69,044	72,304	77,782	80,723
November -	26,924	8,790	11,868	3,615	51,197	57,822	58,050	62,948	70,712
December -	48,440	9,738	7,006	4,026	69,210	72,127	58,581	82,933	71,875
Totals -	432,610	127,162	181,685	95,391	836,848	846,489	954,445	977,305	1,017,314

(2.) COMPARATIVE STATEMENT of YEARLY ATTENDANCE of VISITORS to the MUSEUM from 1897 to 1901 inclusive.

YEAR.	Total for the Year.	Average Monthly Attendance.		Total Monthly Average.
		Free Days, Morning & Evening.	Students' Days.	
1897 - - - -	1,017,314	66,719	18,057	84,776
1898 - - - -	977,305	64,851	16,591	81,442
1899 - - - -	954,445	62,705	16,832	79,537
1900 - - - -	846,489	54,728	15,812	70,540
1901 - - - -	836,848	54,597	15,140	69,737

Total since the opening of the Museum on 22nd June 1857, 39,671,747.

(3.) ATTENDANCE OF THE PUBLIC DURING HOLIDAYS IN THE PAST FIVE YEARS.

YEAR.	Easter.		Whitsuntide.		First Monday in August.	Christmas.	
	Easter Monday.	Easter Week.	Whit Monday.	Whitsun Week.		Boxing Day.	Christmas Week.
1897 -	19,196	56,033	10,590	27,815	9,709	12,197	38,602
1898 -	15,351	43,025	13,378	34,123	10,568	8,834	37,729
1899 -	16,143	43,800	25,980	49,477	11,424	7,279	22,371
1900 -	18,550	44,186	9,218	25,043	14,176	8,999	26,346
1901 -	18,043	48,286	6,818	22,758	10,507	7,624	33,221

(4.) RETURN OF RECEIPTS.

——	1897.			1898.			1899.			1900.			1901.		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
Admission fees -	699	13	6	603	10	6	582	18	6	532	10	0	425	19	0
Periodical tickets	91	15	6	88	18	0	84	9	6	73	14	6	70	13	6
Catalogues - -	98	0	8½	111	11	4	149	5	5	116	8	7	103	14	9
Lecture tickets -	20	1	0	5	17	0		—			—			—	
Waiting rooms -	47	1	5	44	10	2	38	13	2	33	8	8	28	14	4
Private societies	14	0	0		—			—			—			—	
Forfeits for lost Keys - -	2	7	6	0	17	6	0	17	6	0	12	6		—	
Totals - -	972	19	7½	855	4	6	856	4	1	756	14	3	629	1	7

(*b*) *Bethnal Green Branch Museum.*

(1.) RETURN OF MONTHLY ATTENDANCE OF VISITORS.

1901.	Weekdays.		Sundays.	TOTALS.	Corresponding Numbers in			
	Morning.	Evening.			1900.	1899.	1898.	1897.
January -	23,442	14,108	1,910	39,460	47,222	28,433	30,928	25,841
February -	13,983	12,244	4,579	30,806	38,092	25,118	27,739	26,767
March -	21,940	17,650	12,052	51,642	50,039	29,973	32,932	33,711
April -	34,584	15,440	8,511	58,535	62,477	53,200	45,603	39,242
May -	20,385	12,989	9,939	43,313	40,315	52,633	39,415	33,707
June -	14,394	10,007	10,844	35,245	39,186	34,295	32,462	28,713
July -	18,238	8,317	8,461	35,016	34,913	35,132	31,731	26,830
August -	30,736	10,905	8,194	49,835	51,134	50,732	42,944	38,112
September	11,460	10,777	9,698	31,935	33,652	34,631	26,641	30,574
October -	14,515	11,282	6,317	32,114	34,328	32,180	29,483	29,012
November -	18,007	11,176	2,131	31,314	31,196	27,970	20,458	26,546
December -	36,640	10,808	2,389	49,837	43,694	36,590	31,947	27,048
Totals -	258,324	145,703	85,025	489,052	506,248	440,917	392,283	366,103

Total since the opening of the Museum on the 25th June 1872, 15,635,934.

(2.) ATTENDANCE OF THE PUBLIC DURING HOLIDAYS IN THE PAST FIVE YEARS.

YEAR.	Easter.		Whitsuntide.		First Monday in August.	Christmas.	
	Easter Monday.	Easter Week.	Whit Monday.	Whitsun Week.		Boxing Day.	Christmas Week.
1897 -	4,626	15,559	4,152	10,005	3,321	3,204	10,163
1898 -	5,285	18,399	5,019	13,756	3,610	3,138	11,763
1899 -	5,940	20,126	7,530	18,869	4,428	3,256	16,582
1900 -	8,272	27,225	5,802	15,783	4,488	3,992	15,166
1901 -	7,449	24,275	4,951	13,182	4,728	4,666	23,607

(3.) RETURN OF RECEIPTS.

	1897.	1898.	1899.	1900.	1901.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Catalogues - -	4 0 6½	6 18 0½	7 17 3	9 10 5½	8 5 3
Waiting rooms -	5 5 5	5 2 8	4 1 11	4 5 11	3 15 8
Totals - -	9 5 11	12 0 8	11 19 2	13 16 4½	12 0 11

ART MUSEUM RETURNS.

(Including the Indian Section.)

(1.) LIST OF CONTRIBUTORS OF LOANS TO THE ART MUSEUM, 1901.

HIS MAJESTY THE KING. The late Queen Victoria's Jubilee Presents and addresses for the years 1887 and 1897; original models for statuary at Frogmore, etc., furniture, Chinese objects, horse furniture, and an ermine lined velvet robe formerly belonging to King George II.

(From Clarence House, the residence of the late Duke of Saxe-Coburg and Gotha). Collections of metalwork, earthenware, furniture, etc.

ALLEN, E. H., ESQ. Additions to his collection of spoons.

BALDOCK, MAJ. G. A pair of Indian sandals.

BELFORD, LT.-COL. E. A. Two knives and forks and MS. relating to them.

BRANDT, R. F. W., ESQ. A North German cabinet of the 17th century.

CATHCART, THE EARL. A portrait in oil by G. Romney and 10 miniatures.

CHAPMAN, R. C., ESQ. Four oil paintings and forty-three water-colour paintings.

CLARKE, C. S., ESQ. Leatherwork base of water-pipe (Huka).

CURRIE, D. M., ESQ. Additions to the collections of silversmiths' work, enamels, etc.

DEVONSHIRE, THE DUKE OF, K.G. A large tapestry of the 15th century.

DONALDSON, G., ESQ. Thirteen specimens of musical instruments.

DU CANE, MAJ.-GEN. SIR E. F., K.C.B. A collection of costumes, chiefly of the 18th century.

DU CANE, R., ESQ. Three oil paintings.

FARQUHARSON, COL. V. Additions to the collection of armour.

FITZHENRY, J. H., ESQ. Additions to the collections of silversmiths' work, metalwork, enamels, glass, wood and leather.

HUDSON, MISS M. B. A collection of Sheffield plate.

JACKSON, C. J., ESQ. A collection of silversmiths' work, etc.

JERMYN, CAPT. T. A set of vases from the Temple of Heaven, Peking; an enamel vase, and a scroll.

JOHNSTON, MRS. E. Five portrait miniatures, and two rings.

KENDRICK, H. B., ESQ. A set of Imperial brocade hangings from the palace of the Dowager Empress of China, and a Chinese screen and window blind.

KERR, MRS. Two small carved and painted wood figures, and a gilt lead plaque with figure of Buddha.

LE ROY, REV. G. A panel of embroidery.

LYON, H. THOMPSON, ESQ. A large group of the Virgin and Child. Flemish; 17th century.

MAITLAND, P. F., ESQ. A marble bas-relief and three marble statuettes.

MORGAN, J. PIERPONT, Esq. A collection of bronzes, enamels, maiolica, glass, ivories, etc.

MYERS, DUDDEY B., ESQ. A collection of Egyptian shoes, Persian boots Saracenic panels and Persian earthenware jar.

NAJIBABAD, BEGUM OF. A gold betel case, "Khasdan."

ROBINSON, SIR J. C., C.B. A collection of silversmiths' work, metalwork, enamels, etc.

ROOTS, MISS G. Embroidered satin coverlet.

SALTING, G., ESQ. Additions to the collections of pottery, metalwork, silversmith's work, enamels, etc.

SMITH, G. O., Esq. A collection of silver nutmeg graters.

ST. LEGER, CAPT. S. E. A silver jardinière, two pairs of silver candlesticks, and silver forks and a spoon.

VINCENT, J. A. C., ESQ. A Delft bowl.

WALLIS, H., ESQ. Additions to the collections of maiolica, and Hispano-Moresque earthenware; and earthenware fragments and portions of mummy-cloths from Egypt.

WHITEHEAD, T., ESQ. Elizabethan jug with silver-gilt mounts.

WOLSELEY, THE VISCOUNTESS. A collection of Sheffield silver-plate.

WORKS, THE COMMISSIONERS OF H.M. OFFICE OF. A Cartoon and two water-colour drawings.

(2.) LIST OF DONATIONS AND BEQUESTS DURING THE YEAR 1901.

	Reg. No.
ARMSTRONG, T., ESQ., C.B. Two bronze plaquettes. Flemish; about 1600.	815, 816–1901.
ASHBEE, H. S., ESQ., The late. A collection of pottery, glass, metalwork, woodwork and embroideries.	180 to 324–1901.
BARON, MONSIEUR S. A tobacco-grater of carved wood, inlaid with mother-o'-pearl.	990–1901.
BERENS, R., ESQ. An English arm-chair.	884–1901.
BEWERS, MISS E. S. An embroidered net shawl. English; early 19th century.	994–1901.
BONNOR, MRS. J. A., The late. A collection of oil-paintings, porcelain, furniture and a clock.	364 to 379–1901.
BROWN, J., JUNR., ESQ. An ivory fretwork panel, carved by the donor.	938–1901.
BRUCE, H. M., ESQ. A Spanish-American saddle and trappings.	1008–1901.
BULKLEY, E. W., ESQ. A German engraved glass beaker; 17th or 18th century.	179–1901.
BURCHELL, T., ESQ. Two silver cups. English; dated 1617 and 1621.	141, 142–1901.
CASELLA, A., ESQ. A Venetian glass chandelier; 17th century.	907–1901.
CITY OF LONDON, CORPORATION OF. A bronze medal (City of London Imperial Volunteers) by G. J. Frampton, R.A.	1159–1901.

CLARKE, J. SOMERS, ESQ., F.S.A.
Three specimens of Ancient Egyptian blue-glazed ware. 1112 to 1114–1901.

COLE, A. S., ESQ.
Specimen of needlepoint lace from New Ross, Co. Wexford. 1122–1901.

DOAT, MONSIEUR T.
A stoneware paperweight made by the donor at Sèvres. 956–1901

DONALDSON, G., ESQ.
Furniture from the Paris Exhibition, 1900. 4, 5, 143 to 147, 149–1901.

DURNING-LAWRENCE, SIR E., BART., M.P.
A collection of oil-paintings, furniture, clocks, and city relics. 620 to 663–1901.

DU SUAN DE LA CROIX, COMTE.
An enamelled gold cravat pin. 968–1901.

DUVEEN, MESSRS.
A tapestry panel ; early 18th century. 1161-1901.

EGYPT EXPLORATION FUND.
A collection of Ancient Egyptian objects in ivory. gold, metal, glass, earthenware and wood. 1035 to 1055, 1165–1901.

FARMER, C. B., ESQ.
Seven specimens of Spode and Wedgwood ware and three glass paperweights. 421 to 427–1901.

FITZHENRY, J. H., ESQ.
A carved stone capital. 904–1901.
Stone statues and other carvings in stone and marble. 1652 to 1660–1901.
Twenty-four plates of Chantilly porcelain. 1285 to 1308–1901.

FORRER, DR. R.
A Cyprian bowl and fragment of earthenware. 1181–1901.

GIBSON-CARMICHAEL, SIR T. D., BART.
A carved wood group—Hercules carrying off Deianeira from Achelous. School of Giovanni da Bologna ; 16th century. 939-1901.

GRAHAM, MRS.
A Chinese porcelain bowl. 48–1902.

HAUTENVILLE, REV. R. W., The late.
An English tankard of carved boxwood. 406–1901.

HAWEIS, REV. H. R., The late.
A bell and canopy. Belgian ; dated 1879. 991–1901.

JAMES, MISS EDITH, The late.
A water-colour painting of the Choir of St. Paul's Cathedral. 158–1901.

JEFFERY, G., ESQ.
A glass hand-grenade found at Famagusta, Cyprus. 1069–1901.

LEIGHTON, J., ESQ.
A souvenir of the 1851 Exhibition in the form of a bronze inkstand. 481–1901.

MCCLURE, MRS.
Two water-colour drawings from vestments in Halberstadt Cathedral. 1586, 1587–1901.

MACMINN, C. W., ESQ.
Wedgwood ware salad bowl and sauce boat. 139, 140–1901.

MASON, J., ESQ.
A wrought-iron fetter. 405–1901.

MONTAGU, SIR S., BART.
Four pieces of English furniture of the time of Charles II. 407 to 410–1901.

PAPINEAU, MISS A.
Four wood-carvings from the "Old Palace" at Bromley-by-Bow. 859 to 861–1901.

REYNOLDS, MISS M.
Needlework portrait of George III., worked by Mrs. Knowles in coloured worsteds. 160–1901.

ROGERS, A., ESQ.
A collection of Indian glass from Kapadwanj, Bombay. 6 to 23–1901 (I.S.)

STEVENSON, W., ESQ.
A collection of fragments of pottery, tobacco pipes and bricks found during excavations in Hull. 380 to 392, 877, 878–1901.

TAYLOR, MRS. E. C., The late
A five-guinea piece of George II. 344–1901.

TECHNICAL EDUCATION BOARD, The
A modern English walnut pilaster. 943–1901.

THOMSON, MRS. E. M.
A dress of satin and silk crêpe. Worn by native ladies of Lima, Peru. 786–1901.

UNION CENTRALE DES ARTS DÉCORATIFS.
A silvered bronze plaquette by Oscar Roty. 175–1901

WALLIS, H., ESQ.
An English carved wood arm-chair. 618–1901.

WARDLE, SIR T., F.G.S.
Two printed cotton and silk dresses. English; first half of 19th century. 1649, 1650–1901.

WESTOBY, G. G., ESQ.
Eight fragments of pottery from Hull. 411 to 418–1901.

WHELAN, F. E., ESQ.
A fragment of plaster frieze from the Alhambra. 360–1901.

WHITELEY, W. R., ESQ., The late.
A miniature by J. D. Engleheart. 1363–1901.

WILLSON, J., ESQ., The late.
An ormoulu clock and a carved ivory crucifix. French. 361, 362–1901.

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(3) LIST OF PAINTINGS ACQUIRED DURING THE YEAR BY GIFT AND BEQUEST.

BONNOR, MRS. JULIA ANNE, The late.
Oil Paintings:—
W. Clarkson Stanfield, R.A.
„ Taking of the Spanish frigate "El Garno" by the sloop "Speedy." 6th May, 1801. 364–1901.
„ View on the Rhine. 365–1901.
„ View on the Scheldt. 366–1901.
J. G. Plazer. The Seasons (4) 367 to 370–1901
F. Boucher (after). Pastoral Scene. 374–1901.

JAMES, MISS EDITH. The late.
Water-Colour:—
Edith James. Choir of St. Paul's Cathedral. 158–1901.

LAWRENCE, SIR E. DURNING, Bart., M.P.
Oil Paintings:—
R. St. Martin. Water Mill at Charentonneau, France. 620–1901.
Jan Martss. Battle Scene. 621–1901
J. W. Allen. An Italian Landscape. 622–1901.

School of Guardi. The Piazza of St. Mark, Venice. 624–1901.
Artist unknown. A Cottage Interior. 625–1901.
School of Canaletto. Piazza del Campidoglio, Rome. 626–1901.
R. A. Constantin. A Portrait of a Youth in Armour. 627–1901.
J. Carabain. Christening Party at Bacharach, Germany 628–1901.
Artist unknown. Landscape with figures. Dutch, 17th century. 629–1901.
J. F. A. Schrader. Italian peasants. 630–1901.
Louis Haghe. Interior of St. Peter's, Rome. 631–1901.
J. W. Oakes, A.R.A. A Devon footbridge. 632–1901.
R. S. Bond. Drift-wood after a storm, Bettws-y-Coed. 633–1901.

Drawing in Pastels :—
J. Luntley. Portrait of General Garibaldi. 623–1901.

WHITELEY, MR. WILLIAM RADLEY, The late.
Miniature :—
John C. D. Engleheart. Portrait of a gentleman. 1363–1901.

(4) LIST OF WATER COLOUR PAINTINGS AND DRAWINGS ACQUIRED BY PURCHASE.

Thomas Allom. The opening of London Bridge by William IV. and Queen Adelaide on 1st August, 1831. 917–1901.
Robert Beavis. Sheep on the Surrey hills. 168-1901.
F. C. Portrait of Miss Annie Larkin (miniature) 805-1901.
Sir Augustus W. Callcott, R.A. Verona. 987-1901.
George B. Campion. Welsh mountainous scene. 982-1901.
Luke Clennell. A Wayside Inn. 980-1901.
J. R. Cozens. Sta Ginistina, Padua. 821-1901.
G. E. Portrait of a young girl (miniature) 357-1901.
Thomas Faed, R.A. Sketches (6) 162 to 167-1901.
Newton Fielding. Ducks. 984-1901.
Thomas Forster. Sarah Jennings, Duchess of Marlborough. 1156-1901.
" " John Churchill, Duke of Marlborough. 1157-1901.
J. Duffield Harding. The Fish Market, Naples. 979-1901.
William L. Leitch. A Sawpit at Houston. 981-1901.
David Loggan. Sir Greville Verney. 1158-1901.
Sir John E. Millais, Bart, P.R.A. My Second Sermon. 399-1901.
" " Sketch for "Christ in the house of his parents." 803-1901.
" " Sketches (3) for "The Order of Release." 804, a & b 1901.
Albert Moore. Somnus. 885-1901.
" " Nymphs Dancing. 886-1901.
— Naish. Portrait of a gentleman (miniature) 356-1901.
Jane Nasmyth. Landscape. 1648-1901.
John P. Neale. Blythburgh Church, Suffolk. 1597-1901.
William A. Nesfield. The Circle of Stones at Stennis, Orkney. 986-1901.
Sir William J. Newton. Portrait of a lady (miniature) 995-1901.
Thomas M. Richardson, sen. Old mill, on Windmill Hill, Gateshead. 985 1901.
William P. Sherlock. View of the Thames, shewing Somerset House in course of construction. 983-1901.
John Sherrin. Rabbits. 169-1901.
J. M. W. Turner, R.A. Pembury Mill, near Tunbridge Wells. 1160-1901.
" " (attributed to). Newark Castle. 1596-1901.
Edmund Walker. Interior of the Great Exhibition, 1851. 1109-1901.
" " Interior of the International Exhibition, 1862. 1110-1901.
" " Exterior of the International Exhibition, 1862. 1111-1901.
James Ward, R.A. A Chester Row. 988-1901.

(5) ABSTRACT OF OBJECTS ACQUIRED FOR THE ART COLLECTIONS (EXCLUDING CASTS AND ELECTROTYPES) BY PURCHASE OR GIFT.

Class.		Given.	Bought.	Cost.
				£ s. d.
I.	Sculpture in marble, stone, &c.	13	4	43 19 0
II.	Mosaics in stone and glass	—	—	—
III.	Carvings in ivory, bone, tortoiseshell, &c.	15	6	24 0 6
IV.	Woodwork, furniture, &c.	55	181	1,208 8 1
V.	Metal work	34	187	816 7 2
VI.	Coins and medals	4	12	64 18 7
VII.	Arms and armour	2	2	65 10 0
VIII.	Silversmiths' work	3	34	183 12 6
IX.	Jewellery and goldsmiths' work	2	20	232 1 7
X.	Enamels on metal	—	12	548 13 4
XIA.	Earthenware and stoneware	144	187	520 0 4
XIB.	Porcelain	26	11	78 0 0
XII.	Glass vessels, &c.	31	8	92 12 2
XIII.	Painted and stained glass	—	—	—
XIV.	Leather work, bookbinding, &c.	33	113	146 18 5
XV.	Textile fabrics and embroidery	10	357	1,933 12 1
XVI.	Lace	2	8	10 1 0
XVII.	Musical instruments	3	—	—
XVIII.	Paintings in oil, water-colour, &c.	*26	169	1,633 10 4
	Total	403	1,311	7,602 5 1

* These numbers do not include the Ionides Bequest, which is separately reported on.
In addition to the objects mentioned in the above return, a collection of pottery, glass, enamels, &c., (Reg. Nos. 1662 to 5685—1901, and 54 to 92—1901 (I.S.)) was transferred from the Geological Museum, Jermyn Street.

CIRCULATION RETURNS.

(1.) RETURN of PROVINCIAL MUSEUMS and EXHIBITIONS to which ART COLLECTIONS have been contributed during the Year 1901, showing NUMBER of OBJECTS, &c. LENT, VISITORS, and RECEIPTS.

Town.	Date.	No. of Objects.	No. of Paintings, Drawings, &c.	No. of Days open.	Visitors.	Receipts.
Provincial Museums.						£ s. d.
Aberdeen	March to December	102	122	—	—	—
Accrington	April to December	112	31	185	24,802	Free.
Alexandra Palace	May to December	882	46	—	—	—
Altrincham	January to September	32	62			
„	September to December	14	46		—	—
Bath	January to July	162	—			
„	August to December	123	56	217	46,087	21 15 6
Belfast	January to December	135	97			
„	December	195	20	302	309,770	12 4 6
Birmingham	January to December	158	58	361	461,491	4 9 1
Birmingham School of Art.	January to July	155	65			
„ „	September to December	142	10	—	—	—
Blackburn	January	103	36			
„	January to December	96	43	238	54,300	Free.
Bolton	January to August	90	26			
„	August to December	137	7	259	32,503	Free.
Bootle	January	191	71			
„	January to December	110	34	303	26,112	Free.
Bradford	January to May	154	10			
„	June to December	150	10	339	413,231	Free.
Bursiem	January to December	283	60	261	20,870	Free.
Bury St. Edmunds	February to December	122	—	282	5,680	10 7 0
Buxton	January to April	81	46			
„	April to December	75	55	283	4,260	Free.
Camberwell	January to May	183	104			
„	May to December	157	212	324	130,300	Free.
Canterbury	January to December	74	—			
„	December	103	—	286	16,317	Free.
Cardiff	January to December	36	31	324	84,811	Free.
Carlisle	January to December	83	64	308	39,045	Free.
Cheltenham	January to July	83	8			
„	July to December	80	110	305	20,209	Free.
Chester	January and February	99	70			
„	February to December	245	76	313	9,624	27 16 6
Cork	January to December	104	38	311	6,541	Free.
Derby	January to October	221	26			
„	November and December	112	35	260	297,309	32 13 6
Derby Technical College.	January	182	94			
„ „	February to December	98	40	110	2,140	—
Devonport	January to December	157	32	303	22,477	Free.
Dewsbury	January to May	51	27			
„	June to December	92	66	311	14,000	Free.
Dover	January to December	156	16			
„	December	106	21	247	24,506	Free.
Dublin	January to December	566	73	—	—	—

Town.	Date.	No. of Objects.	No. of Paintings, Drawings, &c.	No. of Days open.	Visitors.	Receipts.
						£ s. d.
Dundee - - -	January to March - -	315	523	309	240,701	Free.
" - - -	March to December -	225	121			
Dundee, Dudhope Park.	January to December -	118	16	310	138,404	Free.
Edinburgh - -	January to December -	1,571	276	—	—	—
Exeter - - -	January to December -	186	16	302	28,308	Free.
Folkestone - -	January to December -	108	48	304	16,844	Free.
Glasgow - - -	January to May - -	131	—	130	64,716	Free.
Glasgow, Camphill -	January to November -	81	28	313	84,712	Free.
" " -	November and December	124	20			
Glasgow, People's Palace.	January to November -	47	14	313	473,431	Free.
" " -	November and December	101	44			
Greenock - - -	January to December -	79	17	269	18,013	Free.
Halifax - - -	January to June - -	99	49	312	65,185	Free.
" - - -	June to December - -	119	28			
Hanley - - -	January to December -	194	52	301	24,432	Free.
Hastings - - -	January to December -	156	42	306	23,998	Free.
" - - -	December - - -	115	29			
Ipswich - - -	January and February -	236	46	310	57,783	Free
" - - -	March to December -	87	36			
Kendal - - -	January to December -	68	26	306	9,870	Free.
Keswick - - -	January to December -	59	22	231	1,958	41 10 6
Kidderminster -	January to October -	122	14	249	10,853	Free.
" - -	November and December	130	48			
Leeds - - -	January to December -	99	89	306	314,653	Free.
Leek - - - -	January to December -	139	16	300	7,747	Free.
Leicester - - -	January to December -	136	—	363	91,038	Free.
Leicester School of Art.	January to December -	102	118	297	54,059	Free.
Lichfield - - -	January to December -	—	62	312	9,936	Free.
" - - -	December - - -	14	39			
Lincoln - - -	January to December -	56	31	313	1,202	Free.
Macclesfield - -	January to December -	76	68	309	7,989	Free.
Maidstone - -	January to March - -	86	77	309	88,631	Free.
" - -	April to December -	70	3			
Manchester, Queen's Park.	January to December -	85	—	313	101,156	Free.
Manchester School of Art.	January to August -	233	66	286	8,559	Free.
" " -	September to December	197	95			
Mile End, E., Essex House	November and December	196	110	363	24,850	Free.
Newport (Mon.) -	January to August -	110	40	304	36,136	Free.
" " -	September to December	92	39			
Northampton - -	August to December -	100	—	298	3,316	Free.
Northwich - -	January and February -	57	72	303	14,850	Free.
" - -	February to December -	88	66			
Nottingham - -	January to March - -	65	75	313	268,405	563 1 11
" - -	March to December -	86	25			
Oldham - - -	January to June - -	195	51	313	72,683	Free.
" - - -	July to December -	168	12			
Paisley - - -	January to December -	163	10	307	69,140	Free.

Town.	Date.	No. of Objects.	No. of Paintings, Drawings, &c.	No. of Days open.	Visitors.	Receipts
						£ s. d.
Perth	January to December	118	193	306	27,650	Free.
Plymouth	January to December	81	33	362	45,721	Free.
Poole	January	179	22	283	3,623	Free.
"	February to December	103	58			
Portsmouth	January	90	7	305	44,240	Free.
"	February to December	140	7			
Preston	January to November	198	350	308	68,391	Free.
"	December	164	60			
Reading	January to March	190	68	300	88,621	Free.
"	March to December	119	73			
Rotherham	January to August	147	184	308	56,941	Free.
"	August to December	122	110			
Rugby	January to October	81	33	334	14,731	Free.
"	October to December	101	41			
St. Albans	January to December	145	159	260	9,827	Free.
Salford	January to December	173	—	307	133,985	Free.
Sheffield	January to December	235	213	303	319,268	Free.
Sheffield, High Hazels	November and December	67	38	24	8,175	Free.
Sheffield School of Art.	January to December	172	96	200	26,528	Free.
Stockport	January to December	99	6	324	34,223	Free
Stoke-upon-Trent	January to December	117	36	311	7,660	Free.
Sunderland	January to June	94	10	263	29,201	67 4 5
"	July to December	111	10			
Truro	January to December	99	36			Free.
Tunstall	January to December	171	165	305	18,432	Free.
Walsall	January to December	94	308	293	17,370	Free.
Warrington	January to December	166	156	207	29,783	Free.
Wednesbury	January to December	115	35	309	19,619	Free.
West Bromwich	January to December	98	31	260	16,175	Free.
Weston-super-Mare	June to December	193	91	81	6,373	Free.
Wolverhampton	January to December	225	46	362	131,278	Free.
Worcester	January to December	107	20	309	101,500	Free.
Yarmouth, Great	January and February	65	29	283	34,835	Free.
" "	March to December	50	60			
York	January to June	81	16	310	10,838	Free.
"	July to December	98	27			
Exhibitions.						
Birmingham Polytechnic	August to November	73	19	60	333,871	9,304 9 10
Brighton	December	24	27	6	—	—
" Athenæum Hall	October	3	6	6	—	—
Brighton Museum	March to May	—	296	79	—	—
Cardiff Free Library	December	13	4	—	—	—
Croydon Needlework Exhibition		26	—	2	1,250	—

Town.	Date.	No. of Objects.	No. of Paintings, Drawings, &c.	No. of Days open.	Visitors.	Receipts.
Glasgow	May to October	159	23	—	—	—
*Leeds	September	8	216	5	2,407	Free.
*Leicester	October	8	216	6	3,415	Free.
Lewes, Sussex Archæological Society	September to December	47	—	—	—	—
London:						
Burlington Fine Arts Club.	January to May	8	—	—	—	—
Carpenters' Hall	June	35	—	12	4,790	Free.
Crystal Palace, Naval and Military Exhibition	May to October	48	12	—	—	—
Earl's Court, Military Exhibition	May to October	32	24	—	—	—
Hampstead, Fine Art Exhibition	May to August	—	77	54	3,406	6 10 6
Whitechapel Art Gallery.	July to September	209	85	42	137,000	Free.
Newcastle, Northumberland Handicrafts Guild.	July	69	—	5	809	30 16 6
*Norwich	September and October	8	216	5	6,140	Free.
Rouen	June to November	—	84	—	—	—
*Warrington	September	8	216	6	2,155	Free.
Lectures, &c.						
London:						
Art Workers' Guild.	January, March & April	68	22	—	—	—
Hammersmith Town Hall.	October	—	65	—	—	—
Royal Archæological Institute.	April	8	—	—	—	—
Royal Institution	March	20	—	—	—	—
Royal Institute of British Architects.	March	1	25	—	—	—
Society of Arts	February	14	—	—	—	—
Lantern slides lent to 25 Schools of Art and other Institutions.		—	1,331	—	—	—
Provincial Museums		18,484	7,665	8,446	5,979,213	1,062 0 9
Exhibitions		775	1,521	1,075	52,927	101 14 9
Lectures, &c.		111	1,443	—	—	—
Total		19,370	10,629	—	6,032,140	1,163 15 6

* These Exhibitions consisted of a selection of the prize works executed by students for the National Art Competition.

(2.) RETURN of SCHOOLS OF ART AND ART CLASSES, to which OBJECTS, PAINTINGS, DRAWINGS, PHOTOGRAPHS, AND BOOKS have been LENT for the purpose of STUDY during the Year 1901.

Name of School or Class.	Objects.	Paintings, Drawings, and Photographs.	Books.
Aberdeen	16	—	7
Aberystwith	4	17	—
Accrington	37	28	—
Andover	37	6	10
Ashton-under-Lyne	19	26	—
Banbury	16	—	—
Barnsley	—	—	4
Barnstaple	14	17	5
Barrow-in-Furness	15	8	—
Bath	94	15	5
Beckenham	71	160	10
Belfast	54	75	4
Bideford	15	—	—
Bingley	25	9	—
Birkenhead	17	—	1
Birmingham	110	70	—
„ Vittoria Street	79	37	—
Blackburn	17	6	4
Bodmin	—	8	—
Bournemouth	29	14	4
Bradford, Church Institute	16	—	—
„ Mechanics' Institute	65	5	6
„ Technical School	17	—	1
Bridgwater	18	58	4
Bridport	15	—	12
Brighton	—	—	11
Brimscombe	1	17	—
Bristol, Kensington House	15	36	1
„ Queen's Road	15	—	1
Bromley	32	22	12
Bromsgrove	1	—	—
Burnley	—	4	5
Burslem	66	28	2
Bury St. Edmunds	16	64	—
Camborne	14	7	—
Cambridge	25	43	—
Canterbury	16	23	30
Cardiff	—	—	1
Carlisle	16	—	4
Carmarthen	16	18	16
Cashel	—	3	—
Chatham	—	12	—
Chatteris	—	5	3
Cheadle	—	—	2
Chelmsford	28	47	4
Cheltenham	17	—	1
Chester	14	—	5
Chesterfield	17	—	—
Chichester	23	26	11
Chippenham	15	—	—
Chiswick	23	63	4
Cirencester	16	—	—
Coalbrookdale	23	64	9

Name of School or Class.	Objects.	Paintings, Drawings, and Photographs.	Books.
Colchester	95	93	16
Cork	30	—	1
„ St. Vincent's Convent	—	14	2
Coventry	17	—	1
Croydon	27	—	—
Dalkey	8	8	—
Darlington	40	13	—
Darwen	22	15	—
Derby	40	17	1
Devizes	16	—	—
Devonport	16	—	—
Doncaster	—	27	—
Dorchester	17	—	17
Dover	55	33	12
Drogheda	—	28	—
Dublin	—	38	—
Dudley	15	3	—
Dumbarton	17	—	—
Dundee, Albert Institute	—	—	1
„ High School	17	—	—
„ Technical Institute	15	—	—
Dunfermline	34	20	—
Durham	16	—	—
Ealing	—	3	13
Eastbourne	28	52	—
Edinburgh	24	79	6
Epsom	—	13	—
Exeter	12	52	—
Eynsford	58	—	—
Falkirk	18	—	—
Falkland	—	3	—
Falmouth	—	9	—
Farnham	75	37	8
Folkestone	—	2	—
Gainsborough	23	109	20
Galashiels	—	15	4
Gateshead	20	9	—
Glasgow, Athenæum	17	—	—
„ Corporation Buildings	114	73	1
„ Thomson Street	16	—	—
„ Weaving College	69	—	—
Gloucester	36	49	—
Godalming	8	—	—
Gravesend	17	—	11
Grimsby, Great	10	31	4
Guernsey	45	32	10
Halifax	74	125	4
Handsworth	19	—	—
Hanley	77	41	9
Harrogate	14	—	—
Hastings	67	17	8
Hawick	16	—	—
Henley	70	6	—
Hereford	16	3	4
Hertford	16	—	—
High Wycombe	30	70	12
Holmfirth	—	5	—
Horsham	—	—	4

Name of School or Class.	Objects.	Paintings, Drawings, and Photographs.	Books.
Hounslow	—	15	—
Huddersfield	29	18	3
Hull	16	—	1
Ilkley	15	—	—
Ipswich	16	12	5
Jarrow-on-Tyne	—	17	—
Jersey	—	29	—
Keighley	17	—	—
Kendal	33	60	7
Kenmare	23	1	3
Kidderminster	17	—	1
Kingston-on-Thames, Surrey County Council	54	24	—
Lancaster	26	30	—
Leamington, Parade	17	—	—
" Warwick Street	14	—	—
Leeds	16	18	1
" Yorkshire College	95	123	—
Leek	42	—	2
Leicester, Municipal School	17	16	13
" Wyggeston's Hospital	16	—	—
Lewes	16	9	4
Leyton	27	13	—
Limerick	17	4	4
Lincoln	19	77	1
" Lindsey	37	95	—
Liscard	4	44	10
Liskeard	16	4	3
Liverpool	16	—	1
London:			
Battersea Polytechnic	153	85	10
Blackheath	16	4	3
Bloomsbury	17	—	1
Camberwell	124	205	5
Chancery Lane	41	30	5
Chelsea	—	5	1
Clapham	15	—	—
Clapton	77	6	—
Clerkenwell	161	74	2
County Council, Bolt Court	111	127	5
" " Regent Street	28	18	—
Hackney	16	—	—
Hammersmith	57	—	—
Highbury	16	—	—
Holloway	46	77	4
Hornsey	15	—	—
Islington	16	—	—
Lambeth	16	—	—
Merton	20	21	4
New Cross	5	—	—
People's Palace, Mile End	14	—	—
Putney	14	—	—
Regent Street Polytechnic	17	7	—
Saffron Hill	1	—	—
St. Martin's	64	87	14
South Kensington	329	639	5
Stockwell	—	6	—
Stratford	15	—	—
Wandsworth	70	69	—
" Training College	—	6	—
West London	16	—	—
Wood-Carving, School of	19	—	—

Name of School or Class.	Objects.	Paintings, Drawings, and Photographs.	Books.
Londonderry	31	3	—
Loughborough	—	—	21
Lowestoft	17	—	—
Macclesfield	69	—	1
Maidenhead	90	209	25
Maidstone	—	25	4
Malvern	28	26	4
Manchester, Cavendish Street	19	1	—
„ Grammar School	32	—	—
„ Technical School	17	—	—
Mansfield	16	—	—
Margate	53	63	15
Middlesbrough	—	3	—
Morecambe	4	42	1
Nelson	—	—	4
Newark	16	4	3
Newbury	52	45	16
Newcastle, Durham College	81	54	3
„ North'm'land County Council	16	38	—
Newport	—	38	4
Northampton	15	19	5
Northwich	14	14	—
Norwich	15	12	1
Nottingham	17	—	1
Oldham	22	37	4
Oxford	—	—	1
Oswestry	—	7	—
Padiham	—	9	6
Paignton	16	24	11
Paisley	94	46	—
Penzance	20	—	—
Perth	17	6	7
Peterborough	19	61	10
Plymouth, Princess Square	16	—	—
„ Technical School	169	8	11
Plumstead	—	11	—
Pontypridd	5	28	—
Poole	15	—	—
Portland	12	31	—
Portsmouth	—	4	5
Preston	15	—	1
Ramsgate	—	39	11
Reading	114	242	3
Redditch	17	—	—
Redhill	66	141	16
Redruth	15	6	7
Richmond	—	4	4
Rochdale	18	—	2
Rochester	17	30	6
Rotherham	—	6	—
St. Albans	19	4	1
St. Andrews	—	1	—
Salford	16	—	—
Salisbury	49	72	1
Sandringham	23	38	—
Scarborough	16	—	—
Selby	15	3	—
Sheerness	—	30	—
Sheffield	43	4	1
Shipley	15	—	1
Skipton	—	14	—

Name of School or Class.	Objects.	Paintings, Drawings, and Photographs.	Books.
Sleaford	15	—	—
Southampton	28	78	5
Southend	—	16	—
Southport	16	—	1
South Shields	19	—	—
Stafford	17	—	—
Stirling	—	14	—
Stockport	15	—	—
Stoke-upon-Trent	17	—	—
Stourbridge	15	—	1
Stroud	16	—	—
Sunderland	32	32	—
Surbiton	—	12	—
Sutton	—	14	—
Swansea	—	12	1
Swindon	62	65	4
Taunton	20	—	—
Teddington	—	1	—
Teignmouth	60	50	11
Thornton Heath	—	25	—
Tiverton	17	—	10
Todmorden	—	10	—
Tonbridge	—	15	—
Torquay	16	—	1
Tottenham	—	13	5
Truro	17	5	—
Tunbridge Wells	10	—	—
Tunstall	16	25	—
Ventnor	—	4	—
Wakefield	—	3	2
Walkden	—	36	—
Walsall	17	33	—
Walthamstow	16	—	—
Warminster	16	—	—
Warrington	135	38	3
Waterford	17	—	—
" Ferrybank Branch School	14	12	—
West Bromwich	16	—	34
West Ham	147	26	—
West Hartlepool	15	34	2
Weston-super-Mare	16	19	2
Weymouth	16	4	—
Whittlesey	—	12	—
Wimborne	—	—	2
Winchester	51	61	16
Winsford	—	29	—
Wisbech	35	6	8
Wokingham	1	31	—
Wolverhampton	18	—	—
Woolwich	15	4	3
Worcester	33	122	8
Wordsley	2	53	7
Worthing	—	—	5
Wrexham	4	59	5
Yarmouth, Great	14	—	1
York	15	—	—
	7,305	6,735	840
Total		14,880	

(3.) RETURN of SCIENCE SCHOOLS and CLASSES to which COLLECTIONS of SCIENTIFIC APPARATUS have been LENT for INSTRUCTION during the Year 1901.

Name of School.	Subject.	No. of Objects.
Bath, The Guildhall Technical Schools.	Human Physiology	12
Chelmsford, Crane Court Science and Art Classes.	Machine Construction, Part 2	7
" " "	" " 4	8
Darlington, Technical College	Botany	108
Devonport, Municipal Technical Schools.	Machine Construction, Part 1	15
" " "	" " 2	7
" " "	Human Physiology	12
Durham, Bede Training College	Electricity and Magnetism	27
" " "	Botany	108
Helston, Passmore Edwards' School.	Elementary Physiography, Part A	87
" " "	" " B	19
High Wycombe, Science and Art Schools.	" " A	87
" " "	" " B	19
" " "	Advanced Physiography	21
Ipswich, Science, Art and Technical Schools.	"	21
Mere, British School	Elementary Physiography, Part A	87
" "	" " B	19
Merthyr Tydfil, Advanced Elementary Girls' School.	Human Physiology	24
Nelson, Municipal Technical School.	Advanced Physiography	5
Newport (Monmouth), Charles Street Pupil Teachers' School.	Sound, Light and Heat	18
Oswestry, Grammar School	Theoretical Mechanics	24
Redcar and Coatham, Literary Institute.	Elementary Physiography, Part A	87
" " "	" " B	19
Ulverston, Victoria Higher Grade School	" " A	87

Name of School.	Subject.	No. of Objects.
Wellingborough, Church Street Institute.	Machine Construction, Part 3 -	11
,, ,,	,, ,, 4 -	8
Wellington, Courtland Road Art and Technical School.	,, ,, 1 -	15
,, ,, ,,	,, ,, 2 -	7
West Bromwich, Municipal School.	Steam - - - - - -	8
,, ,,	Advanced Physiography - -	21
Wickham Market, National School.	Machine Construction, Part 3 -	11
,, ,,	,, ,, 4 -	8
Windsor, Institute Science and Art Classes.	Advanced Inorganic Chemistry -	49
	Total - - -	1,066

(4.) SUMMARY OF MUSEUMS, EXHIBITIONS, SCHOOLS OF SCIENCE AND ART, ART CLASSES, &c., to which OBJECTS have been lent during the Year 1901.

Museums - - - - -	88	Number of objects, &c., lent	26,149
Exhibitions - - - -	20	,, ,, ,,	2,296
Schools of Art and Art Classes	289	,, ,, ,,	14,880
Lectures, &c. - - - - -	33	,, ,, ,,	1,554
Science Schools and Classes -	20	,, ,, ,,	1,066
Total - - -	450		45,945

(5.) RETURNS of PROVINCIAL MUSEUMS to which AID was granted towards the purchase of WORKS of ART AND SCIENTIFIC OBJECTS.

Name of Museum.	No. of Objects.	Description of Objects.	Aid by the Board.	Total Cost.
			£ s. d.	£ s. d
Belfast	14	Casts of Antique Sculpture	11 6 0	22 12 0
Bruton	20	Models of Scientific Objects	13 19 7	27 19 2
Cardiff	299	Casts of pre-Norman Crosses and Ivory Carvings	45 16 7	91 13 2
Dundee	20	Mechanical Models	56 17 3	113 14 6
Glasgow	24	Casts of Scottish Sculptured Stones	102 10 0	205 0 0
Hastings	46	Engravings and Biological Specimens	7 16 7	15 13 2
Manchester	53	Casts of Antique and Renaissance Sculpture, Marble Vase and Photographs of Old Masters	138 4 5	276 8 11
Nottingham	35	Indian Metalwork	15 0 0	30 0 0
Preston	21	Reproductions of Antique Sculpture, Electrotypes, and Painted Copies of Cartoons	137 14 3	275 8 6
Rotherham	5	Painted Copies of Cartoons	25 0 0	50 0 0
Sheffield	87	Metalwork and Reproductions of Pottery	53 0 1	106 0 2
TOTAL	624	£	607 4 9	1,214 9 7

THE ROYAL COLLEGE OF SCIENCE, LONDON, WITH WHICH IS INCORPORATED THE ROYAL SCHOOL OF MINES.

REPORT FOR THE SESSION 1900-01.

In anticipation of the completion of the new buildings of the College and the arrangement of the New Courses of Study in the London University—to which the College is now affiliated—it has been found impossible, up to the present time, to introduce certain necessary changes in the curriculum. The delay of the University Authorities in fixing the Standard of Matriculation has necessitated the postponement of the consideration of the Entrance Examination for the College.

The success of a considerable number of the Students in the London University Examinations has afforded evidence, as in former years, that the position of the College among the Schools of the University has been well maintained.

At the end of the Session, the Council had to regret the loss of two of its members, Sir Norman Lockyer, who retired after 20 years' service, in consequence of his having reached the limit of age, and Professor Rücker, after 15 years' service, on his taking up the appointment of Principal of the University of London. It is gratifying to the Council to know that both of these gentlemen—the former, in his position as Director of the Solar Physics Observatory, and the latter, as the organizing Chief of the University—may still be able to add to their past services to the College by advice and assistance in the future.

The Session was opened in October, 1900, by Professor C. Le Neve Foster, D.Sc., F.R.S., who distributed the medals, prizes, and certificates awarded during the preceding Session.

The following tabular statement gives the number of students under instruction during the Session 1900–01, *i.e.*, from 3rd October, 1900, to 30th June, 1901.

Subjects.	Associateship Students						Occasional Students.			Grand Total.	Individual Students.
	National Scholars.	Royal Exhibitioners.	Local Exhibitioners.	Free Students.	Fee-paying Students.	Total.	Students in Training for Teachers.	Fee-paying Students.	Total.		
Mechanics - 1st term	19	7	3	5	25	59	10	4	14	73	74
Mechanics - 2nd term	6	3	1	1	—	11	4	2	6	17	
Mathematics	43	11	5	9	36	104	16	4	20	124	124
Physics - 1st term	5	—	—	—	—	5	4	1	5	10	94
Physics - 2nd term	24	3	3	3	3	76	13	4	17	93	
Astronomical Physics	20	3	2	2	37	64	9	2	11	75	75
Chemistry - 1st term	26	5	3	18*	56	108	20	4	24	132	134
Chemistry - 2nd term	7	—	—	14*	1	22	10	3	13	35	
Biology - 1st term	7	1	—	—	—	8	10	—	10	18	20
Biology - 2nd term	5	1	—	—	—	6	5	1	6	12	
Geology - 1st term	1	—	—	—	—	1	5	—	5	6	88
Geology - 2nd term	20	5	2	3	30	60	15	13	28	88	
Metallurgy - 1st term	4	—	—	5	26	35	2	16	18	54	56
Metallurgy - 2nd term	4	—	—	2	5	11	2	2	4	15	
Mining	1	—	—	2	27	30	2	11	13	43	43

* Includes Inland Revenue and Customs students.

Total number of individual students - - - - 314

Of which—Government students - - - - - 176
Fee-paying students - - - - - 138

The amount received for fees during the Session was £3,244 15s. 0d.

Number of Science teachers who received instruction during July, 1901.

	Number who attended.
Chemistry - - - - - -	33
Experimental Physics - - - -	39
Metallurgy - - - - - -	13
Physiographic Geology - - - -	33
Practical Mathematics - - - -	40
Vegetable Physiology - - - -	19
Total - - -	177

MECHANICS AND MATHEMATICS.—PROFESSOR PERRY, D.Sc., LL.D., F.R.S.

Mechanics, Part I.—The Courses of Lectures, numerical and other exercise work, laboratory work, and machine drawing extended from October, 1900, to February, 1901, and were attended by 56 students.

Fifty-four students entered for the final examinations, and of these 30 passed in the first class and 20 in the second class.

Mechanics, Parts II. and III.—This course extended from October, 1900, to June, 1901, and consisted of lectures, numerical and other exercise work, laboratory work, and machine drawing.

Twelve students attended the full course, of whom 11 entered for the final examinations; 6 of these passed in the first class and 2 in the second class.

Graphics and Practical Geometry.—This course consisted of general graphical work in the first term, and practical solid geometry in the second term. It was attended by 60 students, of whom 56 entered for the final examination; 36 passed in the first class and 17 in the second class.

The prize given to the best student in Mechanics was awarded to Mr. Leonard Bairstow.

At the end of the session 9 students obtained the Associateship in Mechanics, 7 in the first class, and 2 in the second class.

Summer Course.—Forty-four teachers attended the summer course in July, 1901. A course of lectures on Practical Mathematics was given by the Professor, and, with the aid of Mr. Wrigley and the junior staff, exercise classes were carried on, involving numerical and graphical computations, plotting of curves, and other uses of squared paper, slide rules, planimeters, etc.

Mathematics.—The classes were attended by 124 students, and at the examinations 83 qualified in Class A, 20 in Class B, 18 in Class C, 5 in Class D, and 6 in Class E.

PHYSICS.—PROFESSOR RÜCKER, M A., Sec. R.S.

The courses on Physics were attended by 10 students during the first term, and by 93 students during the second term.

Course I.—The first year's course was attended by 83 students. Seventy-three students entered for the final examinations, of whom 24 were placed in the first class and 38 in the second; 3 passed in the practical work only, and 4 in theory only, while 4 failed in both parts of the examinations. One student was examined in theory only and failed, while 1 was examined in practical work only and passed. Ten students were re-examined in theory, of whom 4 passed; and 4 in practical work, all of whom passed.

Course II.—Five students presented themselves for examination, of whom 2 passed in the first class and 2 in the second.

Summer Course.—Thirty-nine Science teachers attended the summer course of lectures and practical work. The subject was the teaching of Physics by means of lectures and laboratory work, and the lectures were given by Professor Rücker.

The experiment of giving a course on the teaching of Physics was successful. The course was divided into two parts, in the first of which certain general principles of the method of teaching Physics were described, while in the second part specific difficulties were dealt with. In the laboratory a special point was made of instructing the teachers in the construction and use of inexpensive apparatus. This, however, has always been made a feature of the courses to teachers.

The Teaching Associateship.—A start has been made with the preparation of candidates for the teaching associateship in Physics. In this connection the junior assistants in the laboratory have, under the direction of Dr. H. H. Hoffert, visited a number of science schools, where they have had opportunities for seeing the methods adopted for teaching Physics in a number of schools working under the Board of Education. Mr. R. Chapman, the Lecture Assistant, has instructed the candidates for this associateship in the preparation of lantern slides, while they have taken it in turns to assist at the preparation for the lectures to the first-year class.

Research.—Several investigations are in progress in the laboratories, among which special mention may be made of an elaborate series of measurements on the magnetic properties of meteoric iron made by Mr. S. W. J. Smith.

It is satisfactory to be able to report that, as the result of the negotiations and experiments in which the Professor and Assistant-Professor have taken part, it has been agreed that £10,000 should be placed by the promoters of the electric tramways in the neighbourhood of Kew as compensation for the removal of the Observatory, which has been rendered necessary by the magnetic disturbances due to artificial earth currents.

A paper dealing with the subject of the disturbances produced by artificial earth currents, by Professor Rücker was communicated to the Physical Society, and published in the "Philosophical Magazine."

The research work conducted in the laboratory has been very considerably hindered, due to the fact that, owing to illness, the staff was short-handed. Mr. Watson, however, completed his determination of the value of the earth's field at Kew in international units, and the results were communicated to the Royal Society.

The work on the plans for the new laboratories has been continued, and the details of most of the fittings of the rooms have been settled.

The Professor was absent on sick leave during the first three months of the year 1901, and wishes to record his sense of the valuable service rendered by the Assistant-Professor (Mr. W. Watson, F.R.S.), the whole of the work of the department being carried on during his absence in the most satisfactory manner.

Astronomical Physics.—Professor Sir Norman Lockyer, K.C.B., F.R.S.

The number of students under instruction during the session was 75, divided as follows:—National Scholars, 20; Royal Exhibitioners, 3; Local Exhibitioners, 2; Free Students, 2; Teachers in Training, 9; Fee-paying Students (Associateship Course), 37; Fee-paying Students (occasional), 2. 71 of these presented themselves for the examination, and 3 students were re-examined. 42 passed in the first class, 24 in the second, and 8 failed. The prize of books, value £3, was awarded to S. G. Burrow, who obtained full marks in every section of the work.

Demonstrations were given in the Observatories from 4 p.m. to 6 p.m. on Tuesdays and Thursdays from October to May, consisting of lessons in general Elementary Astronomy, and practical work with the equatorial, transit instrument and sidereal clock, altazimuth, wire micrometer, stellar spectroscopes, and sundial.

From the 12th to the 29th June the students attended during the usual college hours for a course of 12 lectures on Astronomical Physics, and further practical work in the observatories and laboratories. In the absence of the Professor on sick leave the lectures were given by Dr. W. J. S. Lockyer, M.A., Ph.D., F.R.A.S., and the course generally was under the supervision of the demonstrator, Mr. Fowler. The practical work was nearly the same as in former years, consisting of instruction in the use of the globes and Nautical Almanac, graphical exercises, construction of a two-inch telescope, spectrum observations and photography, the use of the sex-

tant, theodolite, plane table and prismatic compass. Special attention was given to the determination of time, latitude, and the meridian line.

The instruction from October to May was given by Mr. Fowler, with the assistance of Messrs. H. Shaw and A. E. Hodgson, teachers in training attached to the division. For the June course, owing to the great distances between the various laboratories, the usual temporary assistance was required, and the thanks of the Professor are due to the following past students who aided in the instruction :—

Messrs. W. H. Clarke,
W. H. Goodchild,
H. E. Goodson,
W. J. Jarrard,
G. W. C. Kaye,
W. J. Lyons,
E. R. Marle.

Research Work.—The results of some of the investigations made during the Session are given in the following papers communicated to the Royal Society by the Professor, the list also including papers giving the results of investigations made by the Professor in conjunction with the staff of the Solar Physics Observatory.

"Further Note on the Spectrum of Silicium."—Roy. Soc. Proc., Vol. 67, pp. 403—409.

"On the Solar Changes of Temperature and Variations in Rainfall in the Region surrounding the Indian Ocean."—Roy. Soc. Proc., Vol. 67, pp. 409—431.

"The New Star in Perseus." Preliminary Note. Roy. Soc. Proc., Vol. 68, pp. 119—124.

"Further Observations on Nova Persei."—Roy. Soc. Proc., Vol. 68, pp. 142—146.

"Further Observations on Nova Persei, No. 2."—Roy. Soc. Proc., Vol. 98, pp. 230—235.

"On the Enhanced Lines in the Spectrum of the Chromosphere." Roy. Soc. Proc., Vol. 68, pp. 178—188.

"On the Arc Spectrum of Vanadium."—Roy. Soc. Proc., Vol. 68, pp. 189—210.

"Further Observations of Nova Persei, No. 3."—Roy. Soc. Proc, Vol. 68, pp. 189—210.

Total Eclipse of the Sun, January 22nd, 1898. Observations at Viziadrug."—Phil. Trans., Vol. 197A, pp. 151—227.

The Professor, who retired under the age rule on September 30th, 1901, is anxious to take this opportunity of giving his testimony to the devotion to duty, high intelligence and skill, and complete loyalty of those who have assisted him since the commencement of Astronomical teaching in this College in 1882. Specially among these must be mentioned Mr. Fowler, who has held the position of demonstrator since 1888.

He begs also to tender his thanks to the many students, who in their turn have attended the course, for the extremely pleasant relations which have existed, unbroken, between Professor and student. The remembrance of this will always be to him a source of the greatest satisfaction.

He is proud of having been instrumental in founding a practical course of instruction in a much neglected subject—a course which still stands alone in Europe, although it is being copied in the United States.

Chemistry.—Professor Tilden, D.Sc., F.R.S.

The instruction in this division consisted of :—

(1.) A course of about 65 lectures on inorganic chemistry, and the principles of chemical philosophy, extending from the beginning of October to the middle of February, delivered to students in their first year by Professor Tilden.

(2.) A course of 30 lectures on physical and theoretical chemistry, extending from the end of October to the end of January, delivered to students in their second or third year by Dr. J. C. Philip.

(3.) A course of 30 lectures on elementary organic chemistry, extending from the middle of February to the beginning of June, delivered to students in their first or second year by the Assistant Professor, Dr. Palmer Wynne.

(4.) A course of 60 lectures on organic chemistry, extending from the middle of February to the beginning of June, delivered to students in their second or third year by the Assistant Professor.

In addition to the foregoing courses, frequent lectures and demonstrations on the principles underlying qualitative and quantitative analysis were given in the laboratories, and classes for the instruction of the junior students in chemical arithmetic were also held.

The summer course in Chemistry extended from July 3rd to July 25th, both inclusive, and was attended by 33 teachers, of whom 25 presented themselves for the first time. A special course of instruction was arranged for them in the South Chemical Laboratory. Two lectures on teaching Elementary Chemistry and two lectures on the application of modern themes in Chemistry were given by Professor Tilden. A demonstration was also given of the production and properties of liquid oxygen and air.

The number of students receiving chemical instruction during the Session was as follows :—

——	National Scholars.	Royal Exhibitioners.	Local Exhibitioners.	Free Students.	Associateship Students.	Teachers in Training.	Occasional Students.	Total.
1st Term -	26	5	3	18*	56	20	4	132
2nd „ -	7	-	-	14*	1	10	3	35†

* Includes Inland Revenue and Customs students.
† Thirteen students in addition attended in the afternoons only.

The summer course for teachers was attended by 33 students of Chemistry.

The conduct and diligence of the students in the various classes have been satisfactory.

Research Laboratory.—Miss M. A. Whiteley, B.Sc., continued her investigation of the oxime of mesoxamide and allied compounds.

Dr. H. Burrows, A.R.C.S., was engaged in studying the constitution of limettin.

Mr. C. A. West, B.Sc., A.R.C.S., made a series of experiments with the object of ascertaining the molecular weight of phosphorus tetroxide.

The following papers, containing the results of experimental work performed in the Chemical Laboratories, were published during the Session :—

The Chlorination of Toluene. By Dr. W. Palmer Wynne, F.R.S., Proc. Chem. Soc., 1901, **17**, 76.

A Laboratory Method for the Preparation of Ethylene. By G. S. Newth. Trans. Chem. Soc., 1901, **79**, 915.

Infracampholenic Acid, an Isomeride of Campholytic and Isolauronolic Acids. By M. O. Forster. Trans. Chem. Soc., 1901, **79**, 108.

Studies in the Camphane Series. Part II. Nitrocamphene, Aminocamphene, and Hydroxycamphene. By M. O. Forster. Trans. Chem. Soc., 1901, **79**, 644.

Studies in the Camphane Series. Part III. Action of Hydroxylamine on the Anhydrides of Bromonitrocamphane. By M. O. Forster. Trans. Chem. Soc., 1901, **79**, 653.

Preparation and Properties of 2 : 6-Dibromo-4-Nitrosophenol. By M. O. Forster and W. Robertson, A.R.C.S. Trans. Chem. Soc., 1901, **79**, 686.

Studies in the Camphane Series. Part IV. The Isomerism of -Benzoylcamphor. By M. O. Forster. Trans. Chem. Soc., 1901, **79**, 987.

Studies in the Camphane Series. Part V. Halogen Derivatives of *p*-Cymene from substituted Nitrocamphanes. By M. O. Forster and W. Robertson, A.R.C.S. Trans. Chem. Soc., 1901, **79**, 1003.

Note on the Reduction of Ferric Salts. By G. T. Morgan, D.Sc. "The Analyst," September, 1901.

A Spectroscope Slit for Photographic Work. By Chapman Jones. Journ. Roy. Phot. Soc., N.S., **25**, 219.

A Simple and Inclusive Method of Testing Photographic Plates. By Chapman Jones. Journ. Roy. Phot. Soc., N.S., **25**, 246.

Analytical Laboratories.—The North and East Laboratories were under the charge of Mr. Chapman Jones, who was assisted by Dr. J. C. Philip, M.A., Dr. F. H. Newman (teacher in training), and Mr. H. V. Capsey (teaching scholar).

During the winter term 60 students worked in these laboratories, 50 taking the course prescribed for Part I., two of these pursuing it with the addition of more advanced quantitative work. The remaining ten students continued the ordinary work for Parts II. and III.

During the summer term these laboratories were attended by 22 students namely, 1 beginner, 7 who worked in the afternoon only, 13 who continued the ordinary course for Parts II. and III., and 1 who was engaged in qualitative work only.

The quantitative work included the analysis of minerals, alloys, natural waters, gases, and organic substances ; the determination of vapour densities, chemical equivalents, molecular weights, melting and boiling points ; the use of the polarimeter, and the application of electrolytic methods. The advanced students also prepared a number of organic substances.

The South Chemical Laboratory was under the charge of Dr. M. O. Forster, who was assisted by Dr. G. T. Morgan, Mr. W. Robertson (teacher in training), and Mr. E. A. Jenkinson (teaching scholar).

During the first term the laboratory was attended by 57 students, of whom 43 passed through the course of instruction in qualitative and quantitative analysis prescribed for Part I., and 14 were engaged in the quantitative work prescribed for Part II.

During the second term there were 24 students in the laboratory. Four were engaged in the quantitative work prescribed for Part II., and 12 in the course prescribed for Part III., consisting of quantitative analysis, qualitative organic analysis, and preparation of purified substances ; 2 practised general chemical operations, and the remaining 6 attended the laboratory during afternoons only, and were engaged in the quantitative exercises prescribed for Part II.

The quantitative course included mineral analysis ; gas, water, and sugar analysis ; determination of chemical equivalents ; determination of molecular weights from measurements of vapour density, and of the freezing point of solutions ; determination of density ; melting point, boiling point, and specific rotatory power ; analysis by electrolysis ; and the preparation of purified substances, both organic and inorganic. The short course in July was attended by 33 teachers, who worked in this laboratory under the direction of Dr. M. O. Forster, who was assisted by Dr. G. T. Morgan, Mr. Robertson, and Mr. Jenkinson. Of these students 25 were at first occupied with a course of practical exercises specially arranged by the Professor with a view to the requirements of this class, subsequently passing to more advanced work of various kinds. Eight had been through this course on a previous occasion, and of these 7 devoted their time to the preparation and identification of organic compounds, and 1 to advanced quantitative analysis.

During the second term practical instruction in photographic methods was given to a select number of students on one afternoon in each week by Mr. Chapman Jones.

ZOOLOGY.—PROFESSOR G. B. HOWES, LL.D., F.R.S.

The Laboratory Work of the Session was conducted on the lines of that of 1899-1900 with modifications necessary to bring it up to date. The Practical Elementary Class was attended by 10 students, the elementary lectures (of which 48 were given by the Professor) by 16.

In the examination which followed 9 students presented themselves, all of whom passed, one in the first class.

The Advanced Laboratory Course lasted throughout the whole Session, and was attended by 6 persons. These, and 3 students who were working specially, attended the Lectures, of which there were given by the Professor a Course upon the Invertebrata, with special reference to the Echinodermata, Coclenterata, certain vermiform organisms, the Porifera, and Protozoa; and by the Demonstrator a special series on the Gastropoda. Five students sat for examination at the end of the term, all of whom passed, one in the first class.

Owing to the Botanical nominee for the Marshall Scholarship having obtained employment, the award was made to Mr. W. B. Randles, B.Sc., an advanced student of the previous Session, to enable him to continue his investigations into the morphology of the Gastropoda. For a research he is now conducting, with a view to a revision of the British Trochidæ, Mr. Randles, during the autumn recesses of 1900 and 1901, was, by a Royal Society's Grant, enabled to proceed to Plymouth for study and the collection of material.

A studentship was awarded Mr. H. H. Swinnerton, B.Sc., the Marshall Scholar of the previous Session, for purposes of research and assistance in the teaching. Mr. Swinnerton worked energetically and with much success, and produced at the end of the Session a memoir, entitled "A Contribution to the Morphology of the Teleostean Head Skeleton, based on the Study of the Development of the Stickleback (*Gasterosteus aculeatus*)," now in course of publication in the Qu. Journ. Micr. Science, Vol. XLVI. Mr. Swinnerton also assisted in the work of the re-arrangement of the Invertebrate Teaching Collection, still proceeding.

In the intervals of his work in the British Museum of Natural History, Mr. H. M. Bernard, M.A., continued his enquiry into the minute structure of the retina, upon which he has published a further paper in the Qu. Journ. Micr. Science, Vol. XLIV., p. 443; and the resources of the division were further utilised, in connection with research, by Dr. Marett Tims, B.A. Camb., who published a paper on the Dentition of the Rodentia with especial reference to the Guinea Pig, in the Linnean Soc. Journal, Zool., Vol. XXXVIII., p. 261; and by Mr. J. E. S. Moore, to whom a free place was granted, for the continuation of his work upon the African Lake Fauna.

The following books and papers were completed and published, in addition to those above named, in connection with the work of the division:—

Howes, G. B.—On the Egested Egg-shell of the Egg-eating Snake of Africa, *Dasypeltis scabra*. "Nature."

Moore, J. E. S.—On the Mountains of the Moon, being a preliminary account of the scientific results of two expeditions to Tanganyika and the country and lakes adjacent.

Moore, J. E. S.—Tanganyika and the Continents North of it. Journ. Roy. Geog. Soc., 1901, p. 1.

Moore, J. E. S.—Further Researches on the Mollusca of the Great African Lakes. Proc. Zool. Soc., 1891

Embleton, Miss Alice L.—*Goidelia Japonica*, a New Entozoic Copepod from Japan, associated with an Infusorian (*Trichodina*). Jour. Linn. Soc., Zool., vol. XXXVIII., p. 211.

Numerous acquisitions for the teaching collection were during the Session obtained by presentation and purchase. Of altogether exceptional interest and value are some further specimens of the limb-bearing trilobite, *Triarthrus Becki*, purchased through the good offices of Dr. Beecher, of Yale College Museum, U.S.A. (who had already presented to the College a couple of the original examples described by him) and a magnificent specimen of the giant deep-sea isopod, *Bathynomus*, presented by Dr. A. Alcock, of the Indian Museum.

Hardly less valuable for teaching purposes and study are a series of the Virginian oyster (*Ostræa Virginiana*) of known ages up to fifteen years, presented by Mr. Middleton, and a miscellaneous collection of Indian animals from Mysore, presented by Mr. W. R. Slater, now studying in the Geological Division, who also gave some emperor moth's eggs, which have yielded living insects.

Professor Ritter, of California, presented examples of the flat-topped tunicate *Chelyosoma* ; Mrs. Mivart some bird skeletons, which belonged to her late husband ; Professor W. Gregory, of Melbourne, a series of West Indian reptiles, and Dr. Gilchrist, of the Fisheries Department of Cape Colony, a specimen of the hydro-coralline *Allopora*. By exchange there were obtained from Professor Levinsen, of Copenhagen, specimens of the rare deep-sea holothurians (*Elasipoda*).

Among former students of the division, the following contributed to the collections, viz. :– Dr. J. Beard, a series of egg cases of the British Raiidæ ; Dr. Dnerden, of Jamaica, some undescribed Peripatus ; Dr. H. Lyster Jameson, some shells from New Guinea and elsewhere, especially a series of Meleagrinas ; Dr. W. G. Ridewood, some microscopic sections of baleen and other horny excrescences ; and Mr. Bourke some blood-sucking mites (*Ixalidæ*) from British Columbia. To Mr. G. A. Boulenger, F.R.S., Mr. Graves, and Mr. Howell, of Jersey, thanks are also due for materials presented. There were further obtained by presentation and purchase a series of lantern slides, illustrating the early developmental phenomena of certain Echinodermata, prepared by Professor T. H. Bryce, of Glasgow ; and, by purchase alone, a series of microscopic preparations of Haeckel's Radiolaria of the "Challenger" expedition.

During the Session the following appointments were obtained by former students of the division, viz. :—Mr. Hodgson, as Invertebrata Geologist to the "Discovery" on her South Polar expedition ; Dr. H. Lyster Jameson, M.A., as a member of the teaching staff and Curator to the Technical College at Derby ; Mr. H. Swinnerton to a Mastership in the Kingswood School, Lansdown, Bath.

The Professor was appointed the representative of the Board of Education at the Fifth International Congress of Zoologists held in Berlin during August, and was honoured by being nominated the leading representative of Great Britain on the opening day.

Botany.—Professor J. B. Farmer, M.A., F.R.S.

The elementary course in Botany commenced on October 3rd, 1900, and was attended by 10 students, 3 of whom were placed in the first class in the examination held in the following February. The advanced class, beginning on October 3rd, 1900, was attended by 3 students, 2 of whom were placed in the first class in the sessional examination held in the following June. One of them (Mr. E. Drabble) has since obtained a first class in the B.Sc. (Honours) Examination of the London University, and but for disqualification by age would have received the medal awarded to the best candidate in Botany.

Several field excursions were undertaken during the Session.

A special course of lectures on the Vascular Cryptogams was given by the Demonstrator, Mr. C. E. Jones.

A special course of lectures in advanced Cytology was delivered by the Professor, and was attended by 10 students.

A free place was granted to Mr. A. D. Cotton, a former student of the division, to enable him to prosecute investigations on the life-history of certain pathogenic fungi. The research is not yet completed, having been interrupted by Mr. Cotton's removal to Manchester to enter on a teaching appointment as junior Demonstrator in Botany at Owens College.

Mr. T. G. Hill, a teacher in training in the division, has been appointed lecturer on Botany at St. Mary's Hospital Medical School, and Mr. Cavers, who left the College during the preceding Session, has been selected for the post of Demonstrator in Botany at the Yorkshire College, Victoria University.

The Professor has been engaged, in conjunction with Mr. Hill, upon an exhaustive investigation into the anatomy of Angiopteris and Marattia, the results of which are nearly ready for publication.

A summer course in Vegetable Physiology was given to 20 teachers, and the need for additional assistance in the laboratory was supplied by Messrs. Cotton and Hill. A visit was made during the course to the collections in the Royal Gardens, Kew.

The thanks of the Division for donations of material for the laboratory and for research are due to the Directors of the Royal Gardens at Kew and Edinburgh, to Professor Vines, and Mr. C. J. Willis. Especial mention should be made of valuable gifts of material made by Mr. Maiden, the Director of the Sydney Botanic Gardens.

The facilities recently afforded by the Chelsea Physic Garden have proved of great value to the division during the work of the Session.

GEOLOGY.—PROFESSOR J. W. JUDD, C.B., LL.D., F.R.S.

The advanced course of instruction carried on during the first term of the Session was attended by 6 students, 1 being a National scholar, and 5 teachers in training. The course of instruction was in advanced Mineralogy and Petrology and in Geological Surveying. The first-mentioned of these subjects was dealt with in a series of lectures by the Assistant Professor, and the second and third by lectures from the Professor, the lectures being followed by practical work in the laboratory, and in the drawing office, where geological maps and sections were constructed. For the final examination 5 of these students entered, all passing in the first class.

The students attending the elementary class in the second term of the Session were 82 in number, of whom 42 entered for the School of Mines course, and received special instruction in Determinative Mineralogy, while of the remaining 40 students 25 attended the Geology course in the morning only, being engaged during the afternoons in the laboratories of the chemical, physical, or mechanical divisions, according to the branch of science in which they proposed to take their Associateship.

Of the 42 students taking the School of Mines course, 38 attended the final examination, 16 passing in the first class, 17 in the second class, and 5 failing. Of the remaining students 29 entered for the examination, 15 passing in the first class, 17 in the second class, and 2 failing. Two students of former years were re-examined, and passed in the second class.

The highest place in the examinations of the year was gained by Mr. A H. Higgins, to whom was awarded the Murchison medal and prize of books.

During the second term, two Advanced Students received instruction in Palæontology and Stratigraphical Geology, and were examined at the end of the Session, passing in the first class.

The work in the laboratories during the Session was carried on under the general superintendence of the Professor, by the Assistant Professor, Demonstrators (Mr. E. W. Skeats, B.Sc., and Mr. J. A. Howe, B.Sc.), with the following Student Assistants:—Mr. H. Walker, Mr. R. F. Gwinnell, Mr. G. C. Gough, and Mr. R. L. Sherlock. At the end of the Session Mr. J. A. Howe obtained a post on the Geological Survey of England and Wales, and Mr. H. Walker was promoted to be Assistant-Demonstrator in the Geological Division.

A special course of instruction on the methods of teaching Physiography and Geology, with practical work in the Laboratory, was given during the month of July to a class of 33 teachers, selected by the Board of Education, and brought to London for the purpose. The lectures were devoted to a discussion of the methods of teaching, and of the experimental and other illustrations which should be employed. The practical work in the laboratory was devoted to actual preparation of simple apparatus for experimental work, the mounting of specimens for microscopic study, and the preparation of thin slides of minerals and rocks. In addition to these subjects much attention was paid to instructing the teachers in the construction and use of geological maps and sections, each teacher being required to prepare diagrams, &c., from the documents supplied by the Geological Survey, &c., relating to the locality where his class is taught.

Research. – The work of studying the cores obtained by boring operations at the coral island of Funafuti, under a Committee appointed by the Royal Society, has occupied nearly the whole of the time not actually occupied by teaching work during the year. The Professor has had charge of the distribution of the materials among the naturalists who have undertaken their determination and description, while the cutting and slicing of the rock-cores have been carried out in the laboratory. Dr. G. J. Hinde, F.R.S., has devoted many months' work to the detailed microscopic examination of the cores, while Dr. Cullis and Mr. Skeats have been occupied with chemical and mineralogical work in connection with the subject. Mr. F. Chapman has done work upon the micro-organisms, and the following papers have been written by him :—

"On the Foraminifera from the Shallow and Moderately Deep-water Dredgings obtained round Funafuti."

"On the Ostracorda from Funafuti."

These two memoirs are now being published by the Linnæan Society.

Other portions of the volume to be published in the Transactions of the Royal Society are in course of preparation by the Professor and the Assistant Professor.

METALLURGY.—PROFESSOR SIR W. ROBERTS-AUSTEN, K.C.B., F.R.S.

The course in Metallurgy began on October 3rd, 1900, and continued till June 27th, 1901. The number of students attending during the first term was 52, and during the second term 21. In July 15 teachers attended the summer course. The ordinary lectures on metallurgy were delivered by the Professor, and lectures were given by the Instructors in Assaying, during the first and second terms on the principles and practice of assaying, and during the second term on electro-metallurgy.

In addition to the ordinary course in assaying the students conducted certain metallurgical operations, such as the treatment of gold and silver ores in the stamp battery, and by the cyanide and chlorination processes.

During the month of May the students, under the direction of Dr. Stansfield, visited the most important works in the neighbourhood of the following towns :—Cardiff, Swansea, Llanelly, Dolgelly, Bagillt, Chester, and Crewe.

At the final examination 10 students were successful, 4 receiving first-class, and 6 second-class certificates. One student failed to satisfy the examiners. The Bessemer Medal and Prize of Books was awarded to Mr. P. Quartano.

In September, Dr. Stansfield was appointed Professor of Metallurgy at the McGill University, Montreal, and in consequence vacated his post as Instructor in Assaying, to which post Mr. W. H. Merrett was subsequently appointed.

Research.—The Professor has during the past year conducted a number of researches on the heat treatment of iron and steel, and the results will be shortly published by the Institution of Mechanical Engineers, in the Sixth Report of the Alloys Research Committee.

The Professor continued to serve as a member of the Explosives Committee.

In May, 1901, the first Carnegie Scholarships of the Iron and Steel Institute were awarded to Dr. Stansfield and to Dr. Matthews of Columbia University, New York, who had already conducted original work in this division of the College.

An "Honours Associateship" was gained by Mr. C. O. Bannister, in June, 1901, the subject of his investigation being the preparation of malleable iron by the hæmatite sementation process.

A large amount of valuable research was completed in the Metallurgical Laboratory by Mr. W. Campbell, B.Sc., who studied the microstructure of many different classes of alloys, principally those of copper and tin. The greater part of this work has now been communicated to the Institution of Mechanical Engineers.

Mining.—Professor Le Neve Foster, D.Sc., F.R.S.

The course of instruction in Mining began on October 8th, 1900, and was carried on till June 27th, 1901. During the first term 50 students attended lectures on Mining concurrently with the lectures on Metallurgy. The second term was entirely devoted to lectures on Mining and practical instruction ; 45 students attended these lectures and 37 of them took the course of practical instruction.

Dr. Le Neve Foster delivered 66 lectures on Prospecting, Boring, and Mining Operations in general, the lectures being illustrated as usual by lantern slides, diagrams, models, specimens, experiments, &c. Mr. Cooke gave altogether 54 lectures on the Occurrence of Minerals, their Preparation for the Market, the Ventilation of Mines and Mine-Surveying. During the first term Mr. Cooke was troubled with symptoms of "brain-fag," and, acting upon medical advice, he went away and spent four weeks in the volcanic region around Vesuvius, thereby profiting in health and bettering his acquaintance with geological phenomena. In accordance with the regulations of the St. John Ambulance Association, Dr. H. Percy Potter gave 5 lectures and demonstrations in rendering first aid to injured persons.

Three temporary assistants were appointed to assist in giving instruction in Surveying, viz., Messrs. F. H. Nash, C. H. Stewart, and R. C. N. Twite. During the fortnight spent at Godstone Mines a fourth assistant, Mr. E. Levy, was engaged. The Instructor in Surveying wishes to put on record his thanks to Mr. Twite, who cheerfully stayed overtime and assisted in laying out surveys, pegging stations, &c., and who was generally willing and ready to assist in checking students' field and office work after College hours.

Until the last Session the class obtained the major part of its surveying practice in the grounds of the College and the Victoria and Albert

Museum ; this is no longer possible owing to the building of the new College of Science and of the new part of the Museum, and it is a great drawback to the class to have lost a convenient practice-ground. The effect of this loss has been grievously felt, both by instructors and instructed. Instead of simply opening the class-room door and at once finding themselves in their drill-ground, students must now pack and shoulder their instruments and walk into Hyde Park ; this takes at least a quarter of an hour, entailing a loss of time before and after the instruction. Besides, in unsettled weather, it is often not worth while risking a journey into the field, whereas in former years, when the work was interrupted by rain, students could at once retire to their class-rooms and resume office work.

Happily, the remedy for the loss of time entailed by the want of ground immediately contiguous to the College is simple and readily applied. All that is necessary is to increase the number of hours per day, for the hours worked by the students at the College and in the field hitherto have been decidedly short, and there is ample room for increasing these hours without in any way seriously encroaching upon the time necessary for relaxation. With instruction taking place in the open air, there certainly can be no hardship in making students attend to work for seven or eight hours a day. Indeed, it is well that they should at the very outset of their career begin to learn at College that they must not expect to gain their living in after life by working the present absurdly short period between 10 and 4, which includes an interval of very nearly an hour. And, furthermore, owing to the Wednesday and Saturday half-holidays, the time spent at the College on each of those days is only three hours.

Except that the ventilation of the drawing office has been much improved, the class suffered much the same inconveniences as have been detailed in previous reports. It was not found possible under existing conditions to accommodate more than 37 applicants for practical instruction, and of these 10 had to have their drawing tables placed in the lecture room, as, indeed, has been the practice for the past three or four years.

The following table shows the number of students who attended the full course and the number who passed the examinations :—

Branch.	No. of Students in attendance.	Examinations.		
		No. of Candidates.	No. of Passes.	No. of Failures.
Mining - - -	45	41	29	12
Mine-Surveying -	37	33	23	10
St. John Ambulance -	34	31	31	—

The student's place in the class-list is finally determined by adding up the marks obtained in the separate examinations in Mining, Mine-Surveying, and Assaying, and those awarded to him for his work during the Session. A student must, however, obtain enough marks to qualify in each separate division of the subject before a certificate in Mining can be awarded. The final results show that, of the 41 candidates (some of whom had partially qualified in a preceding year) 4 passed in the first class, 21 in the second, and 16 failed. Mr. Stanley C. Dunn did best of all the students, and was awarded the De la Beche medal and the prize of books presented by the Board of Education. Three first-class Associateships and 18 second-class Associateships were granted in Mining.

The external examiner in Mining very justly complains of the infamous handwriting and bad sketching of some of the candidates, and his co-examiner, the Professor of Mining, fully agrees with him.

The chief additions to the equipment (not previously reported) are the following :—A Taylor's Portable Prospecting Stamp Mill ; a "Little

Alaska" Gold Washer; a Wetherill Magnetic Separator (laboratory form); a Meinhardt's Safety Shot-Firer; various Prop-withdrawing Tools from collieries in the North of England and elsewhere; set of Timber-drawing Tools from Courrières Colliery, Northern France; Sylvester's Prop Withdrawer; Robinson and Foggo's Patent Ratchet Lever and Chain; a Russell's Water Gauge with Floating Scale; an Acetylene Mine Sampling Lamp by the Phôs Co.; a Meyer's Patent Louvre Safety Lamp; Louis' Dip Compass; a Brunton Pocket Mine-Compass; one Demonstration Theodolite; one Pedometer; one Zeiss Monocular Field Glass (×8); three 50-foot Constantia Tapes; two 100-foot do.; one 300-foot Steel Tape on Reel; four 100-foot Steel Chains; various Picket Flags, Plumb-bobs, &c.; Bütenschon's Level for Levelling Staff, &c.; one Right-angle Prism, &c., &c. About half a ton of rich tin-ore for vanning, &c., has been presented by Mr. A. J. Bensusan, Assoc. R.S.M., and a suite of specimens, showing the occurrence of graphite, has been given by the Morgan Crucible Co. Specimens collected by Professor Foster and Mr. Cooke have also been incorporated in the collections.

The General Report on Mines and Quarries—a statistical Blue-book dealing with the mining industry of the world—again appeared under the editorship of Dr. Le Neve Foster.

The Professor of Mining has been elected an Honorary Member of the Institution of Mining and Metallurgy, and also President of the Royal Geological Society of Cornwall.

During his holiday Mr. Cooke visited tin and copper mines in Cornwall, collieries and works in Westphalia, and open workings for ironstone in Northamptonshire. Information obtained in this manner is always of much service in the lecture-room.

THE ROYAL COLLEGE OF ART.

REPORT FOR THE SESSION 1900–1901.

Under the scheme of re-organization which came into operation in 1900 the Royal College of Art has continued to be administered as a College for training Art Masters and Mistresses for the United Kingdom, and for the instruction of students in the arts of Drawing, Painting, Modelling and Designing, as applicable to Architecture, Manufactures, and Decoration. The instruction in the College has now been so arranged that students may either pass through a course of instruction in all the four Schools of Architecture, Ornament and Design, Decorative Painting, and Sculpture and Modelling, or may pass through a course in one or more of the Schools only.

The full Associateship is granted to students who have qualified by passing in the course for the four Schools of the Upper Division; the Schools Associateship to students who have qualified by passing in the course for the School of the Upper Division selected by them. Candidates, upon their admission to the College, are placed in the Upper or Lower Division of the College according to their proficiency; and the former separation of classes for male and female students is now dispensed with. The plan of study under the new curriculum has been put to a fair, though necessarily partial test, during the past year, and the system of requiring students to work through the four Schools promises to secure good results.

Free admission is given to holders of Studentships in Training, National Scholarships, Royal Exhibitions, and Free Studentships, all of whom are exempt from the admission tests. Other students are admitted after passing the prescribed tests. Those desiring to enter for the course of instruction for the full Associateship must submit, a fortnight before the end of a term or half-term, a set of drawings as mentioned below:—

Architecture.—A careful drawing of a building, or some portion of an ancient or modern building of artistic interest.

Sculpture.—Two studies of heads carefully drawn from life with the point.

Painting.—A drawing in charcoal of an antique figure; the broad masses of light and shade only to be indicated.

An anatomical drawing (bones and muscles) of the same figure.

Ornament and Design.—Three very careful drawings of flowers and foliage, one in pencil, one in water colour, one in pen and ink; all from the same subject.

A sheet of lettering done from good Roman capitals. The selection of a good plain type is essential.

If these drawings are approved, candidates sit for test examinations in all four subjects, of which they must pass in three. These examinations are held at the commencement of each term and half-term.

The following are the subjects for the test :—

Architecture.—A drawing of a small architectural object in the Victoria and Albert Museum selected for the purpose.

Time allowed : 12 hours.

Modelling.—A model in clay of the mouth of Michael Angelo's David.

Time allowed : 6 hours.

Painting.—A drawing in charcoal from life of the head, hand, and foot, the light and shade being slightly indicated.

Time allowed : 9 hours.

Ornament and Design.—A drawing from memory of a piece of foliage such as that of the oak, ash, or lime.

Lettering by hand of a given sentence ; *or*, a simple problem in designing, to fill a given space.

Time allowed : 9 hours.

Each candidate desiring to enter for the course of instruction for the Schools Associateship (*i.e.*, to specialise in one or more of the four Schools), must state the School to which he desires to be admitted. His application, with the required works, must be submitted a fortnight before the end of each term or half-term.

For the School of Architecture, the works to be submitted by a candidate are :—

(1) A measured study in pencil, upon an imperial sheet, of some portion of an ancient building, to the scale of not less than ½ inch to one foot ; also a drawing of mouldings, full size, and of some ornament.
(2) A perspective sketch of the same subject.

The examination or test of the candidate at the College consists of making a drawing, to be plotted on the spot, from measurement, and executed in six days, of some architectural feature in the Victoria and Albert Museum selected for the purpose.

Time allowed : 6 days.

For the School of Ornament and Design, the works to be submitted by a candidate are :—

(1) Six drawings from nature or architecture, of which at least two must be very careful pencil drawings of flowers and foliage.
(2) A sheet of lettering done from good Roman capitals.

The examination or test of the candidate at the College consists of :—

(1) Drawing from a cast in pencil.
(2) Lettering by hand of a given sentence.
(3) Drawing from memory some piece of common foliage (*e. g.* of the oak, ash, or lime).
(4) A simple problem in design.

Time allowed : 3 days.

For the School of Decorative Painting, the works to be submitted by a candidate are:—

(1) A drawing in charcoal of an antique figure, broad masses of shadow only to be indicated.
(2) An anatomical study in charcoal of the same figure (bones and muscles). The figure to be about one-third life dimensions.
(3) A life-size drawing in charcoal from life of the head and arm ; broad masses of shadow only to be indicated.

The examination or test of the candidate at the College consists of:—

(1) A drawing of a figure from the nude about one-third life dimensions.
(2) A drawing in charcoal of a head from life.

Time for each of these drawings: 6 hours.

For the School of Sculpture and Modelling, the works to be submitted by a candidate are:—

(1) A drawing from the antique.
(2) A drawing from life.
(3) An anatomical rendering in pencil (bones and muscles) of No. 2.

The above figures to be about one-third life dimensions.

The examination or test of the candidate at the College consists of:—

Modelling a bust from the antique.

Time allowed: 6 days.

The Principal of the College considers that these new entrance examinations have proved of benefit as was intended, by eliminating dilettanti students, and admitting none but those who wish to devote themselves to serious study.

Craft Classes have been organized for the instruction of selected students of the Upper Division in Etching and Engraving, Stained Glass, Pottery, Writing and Illumination, Embroidery and Tapestry Weaving, Carving in Stone, Marble and Wood, Furniture Decoration and Gesso Work. The special object of these Craft Classes is to afford students the opportunity of working out one or more of their decorative designs in the materials for which they are intended. Before entering any of these classes, students have to obtain the permission of the Principal; they must either have been students in the School of Design or have already passed through that School.

152 students attended the Craft Classes; many students have attended two classes, and several have attended three. When necessary the Instructor has been assisted by a Student in Training who has shown himself capable at the craft concerned.

Groups of students study at appointed times in the Museum, under the guidance of the Assistant Instructor of the Division in which they are working.

The objects which students have been required to study in the Museum were selected by the Professor or his assistant with the view that the studies of the student should bear directly upon his future career.

During the period from October 1900 to October 1901 the total of all students was 210, of whom 138 were male and 72 female; this shows a decrease on last year of 180. The number of Students in Training has been 35, of National Scholars 20, of Royal Exhibitioners 30, of Local Scholars 17, of Local Exhibitioners 5. Besides these students who received maintenance allowances, 67 specially qualified students were admitted free, and 43 students paid fees for their instruction. Seven students paid fees for a portion of the period, and received free tuition for the remainder of the period.

The fees of the College have been raised from the former rate of £5 per term and £10 per session to £12 10s. per term and £25 per Session.

The total amount of fees paid by students has been £321 8s., showing a decrease on last year of £712 6s. 6d.

Twenty-five students held Scholarships from County Councils; all of hem were awarded free admission.

During the year 9 Students in Training have been appointed to Masterships at Schools of Art, and under the London School Board, viz., James W. Freeth to Limerick; Nathaniel Heard to Shipley; Clarence Mawson to Swindon; William E. Parkinson to Durham; Arthur Schofield to Beckenham; James H. Cronshaw to Heginbottom, Ashton-under-Lyne; George C. Duxbury to Shipley, and then under the London School Board; and Arthur Maude and Harry Jones under the London School Board.

Two National Scholars have been appointed to Masterships; Hugo Koch at Plymouth, and Joseph Else at Belfast.

Four Students in Training have given instruction in London District Schools as a part of their training.

Two Students in Training, whose time has expired, have retired, viz., Thomas C. Bell and Henrietta Gottschalck.

One Student in Training, Annie Allison, retired through ill-health; and one Student in Training, Margaret Winser, resigned.

Three National Scholars, viz., Albert E. Hollinshead, Lydia Coffey, and John W. Wadsworth, have resigned.

Six National Scholars, whose time has expired, have retired; Henry J. L. Bacon, James Durden, Joseph Doran, Henry Green, James Grimstone, and James Hodgen.

Fourteen candidates competed for and have been awarded Studentships in Training, viz., Ada Erwood, Charles S. Groves, Ernest H. Jones, Percival Portsmouth, William W. Stephens, Margaret Winser, Frank M. Jones, Thomas J. Jones, Walter J. Stamps, who were already studying at the Royal College of Art; Alexander B. Macdonald from Sheffield; William H. Wood from Bristol; William H. Young from Redditch; Arthur R. Smith from Keighley; and Maude R. Windley from Leicester.

Nine candidates competed for and have been awarded National Scholarships, viz., Isabella McGregor, Edwin A. Morrow, Sarah A. Reynolds, Ernest H. Thomas, John Whitworth, who were already in the Royal College of Art; Charles Braithwaite and James H. Jeffrey from Belfast, Archibald English from Borough Road Polytechnic, and Susan B. Pearse from New Cross.

Under the re-organization of the College, students do not enter for the National Competition as they did in the past, and do not sit for examination at the annual examinations of the Board. Their work has been reviewed from time to time by the Council of Advice for Art, by whom awards were made in respect of the general character of the work executed by the following students during the session:—

The Prize of £20 for the best student in all the Schools of the College in the Upper Division to Walter Rowbotham, and a Prize of £10 for the best student in all the Schools of the Lower Division to Charles G. Lowther.

The Prize of £10 in Design School to Walter Rowbotham.

The Prize of £10 in Architectural School to Malcolm Osborne.

The Prize of £10 in Modelling School to Ernest G. Gillick, and
The Prize of £10 in Drawing and Painting School to James Wallace.
Four Prizes of £5 each in the Lower Division to Ellen M. Frost, Charles G. Lowther, William Midgley, and Sunderland Rollinson.
Three Travelling Scholarships to Walter Rowbotham, Ernest G. Gillick, and James Wallace.

Some modifications in the foregoing Prize Scheme have been adopted for the Session 1901–1902.

Each Member of the Council for Art reported upon the work of one of the four Schools of the College for the past session.

Design School:—Mr. Walter Crane reports that he found the School in a satisfactory condition, and evincing sound taste both in the upper and lower divisions.

Mr. Crane gave two lectures to this school upon Book Illustration during last session.

Modelling School:—The late Mr. Onslow Ford, R.A., reported that the work done in the School was in every respect highly satisfactory, and in the lower division that by beginners was, owing to the excellent method of teaching employed, quite remarkable.

Architectural School:—Mr. T. G. Jackson, R.A., considered that the drawings of Ornament and measured work were, under the actual conditions, very creditable. The students had been trained to some extent in the other schools of the College, but none of them had had any previous architectural training, and as the School had only been at work seven months their power of design in architectural work was as yet quite undeveloped, and, except in two or three instances, did not as yet show any particular promise. It appeared to Mr. Jackson that Professor Pite had had great difficulties to contend with; he had been obliged to furnish plans, and to some extent elevations, for the students to work upon. It is hoped that greater success may be obtained in this School at the end of another session.

Mr. Jackson addressed the students twice upon their work, which he has examined during his monthly visits.

Painting School:—Sir William Richmond, K.C.B., R.A., reported that this School showed signs of growing vitality, although it was not as yet in such a satisfactory condition as he would desire. While the Cartoon designs were in some instances admirable in intention, both the drawing and colour left much to be desired. Nearly all the drawings from the life were too slight, they were, in fact, only sketches.

Periodical visits were made by students of the School of Architecture, under the guidance of the Professor and his assistant, to buildings in London (St. Paul's Cathedral, Westminster Abbey, and Trinity Almshouses, Mile End Road, etc.), and in the neighbourhood of London (Rochester Cathedral, St. Albans, Hampton Court Palace, etc.), and have had a stimulating effect upon the work of the students in this School. The Professor accompanied students over other buildings which are in course of erection, where the methods of modern construction were described to the students.

Lectures have been given throughout the session in this School by Professor Pite bearing directly upon the work of the School.

In the Design School, under Professor Lethaby, the system of instruction includes the making of studies by the students from plants, flowers, animals, birds, lettering, heraldry, etc.

During the session, lectures have been given by the Professor from time to time.

The provision of greater accommodation for the Modelling School, and the facility thereby secured for students modelling works on a large scale when required, have helped Professor Lanteri to give new and valuable direction to the studies in this School. In its Upper Division three days a week have been devoted to the Antique and Drapery, and two days to Design. The students' models have been judged once a month by the member of the Council of Advice for this School, and the standard of each student's work noted. Casts of the best typical studies have been made and kept as examples in the College.

The Principal calls attention to the fact that the School of Painting has contained a great number of students who had been for some time previously in the College working under the old curriculum ; Professor Moira has not only had new ideas to inculcate but others to counteract. In figure composition, subjects have been given with a view to their possible use as decoration for a Lecture Theatre. The intention has been that no work on a subject should be undertaken without full consideration being paid to its architectural surroundings and its fitness for its purpose. The students in this School have had opportunity from time to time of seeing decorative work being actually carried on.

In the Lower Division of the College the Principal considers that good work is being done. As the students are moved to the Upper School, it is hoped that they will become the means of increasing the strength in character of work done there.

Classes formed for the instruction of Teachers in Training in methods of teaching have been conducted by the Principal. The Primary Drawing Syllabus issued by the Board has been taken as a subject of study, and each student in the class has been encouraged to frame a cognate Syllabus which, in several instances, has been excellent. Although some of the students have been engaged in teaching before entering the College, the majority of them appear never to have demonstrated on the blackboard before. The Principal is well satisfied with the progress made in this class. Several of the students have become excellent draughtsmen with the brush, and the Principal suggests that they might be usefully employed in visiting the Training Colleges in London and its district and giving demonstrations there on Saturday mornings. This would become part of their training as teachers.

The Evening Classes at the Royal College of Art have been devoted to Anatomy, Antique, Life Drawing, and Crafts. Under this arrangement the student is expected to keep up his life drawing regularly while he passes through the four Schools

Teachers in Training have assisted in the Evening School in the Anatomy, Antique, and Life Classes. They have also acted as assistants in the Architectural and Design Schools when groups of students have been sent to make studies in the Museum. In the Painting and Modelling Schools they have been appointed to maintain discipline during the absence of a Professor. Anatomy lectures have been given in the Life Room, and Sir William Abney, K.C.B., gave two lectures upon colour.

Short courses of instruction for Art Masters and Mistresses and students of Schools of Art and Art Classes were given at the Royal College of Art in July. They consisted of (1) classes for instruction and demonstrations in Life Drawing, Anatomy, and Figure Composition; in Architectural Measuring and Sketching; in Design and Crafts; and in Modelling from Life; (2) Lectures by the Professors of Architecture, Painting and Design; (3) Study in the Victoria and Albert Museum. There were 284 applicants for admission to the courses, of whom 120 were given permission to attend.

THE GEOLOGICAL SURVEY OF THE UNITED KINGDOM AND MUSEUM OF PRACTICAL GEOLOGY.

REPORT FOR THE YEAR 1901.

Changes in the Staff.

During the year there have been considerable changes in the Staff consequent on the re-organisation of the Geological Survey and Museum.

Sir Archibald Geikie (Director General) retired at the end of February after a service of more than forty-five years.

Mr. R. G. Symes, Mr. J. Nolan, Mr. A. C. G. Cameron, and Mr. C. E. Hawkins (Geologists); and Mr. Jukes-Browne (Assistant-Geologist); have also retired. Two other vacancies have been caused by the death of Mr. F. W. Egan (Geologist) and of Mr. J. H. Blake (Geologist).

The grade of "Assistant Geologist" having been abolished, the following officers have been appointed as Geologists:—Mr. J. Allen Howe, B.Sc., Mr. H. H. Thomas, B.A.; Mr. H. B. Muff, B.A.; and Mr. W. B. Wright, B.A. Dr. J. S. Flett, M.A., M.B., has been appointed Petrologist, with the rank of Geologist, to take charge of the Petrographical Department. Others who held the rank of Assistant Geologists, including Dr. W. Pollard, Chemist, now take rank with Geologists.

Two Assistants to the Director having been authorised, the positions have been assigned to the two officers who had been appointed as "Acting Directors," namely Mr. H. B. Woodward, and Mr. John Horne.

Six District Geologists to superintend the field-work have also been authorised, and the positions have been assigned to Mr. C. Fox-Strangways, Mr. Clement Reid, Mr. Aubrey Strahan, Mr. B. N. Peach, Mr. W. Gunn, and Mr. G. W. Lamplugh.

Mr. E. T. Newton, Palæontologist, has been placed in the same grade as the District Geologists; and Dr. F. L. Kitchin, Assistant Palæontologist, and Mr. H. A. Allen, Assistant Curator of Fossils, have been placed in the grade of Geologists.

The other new appointments include one additional Fossil Collector, two new General Assistants, three additional Draughtsmen, and three Superintendents of Maps.

Field-work.

England and Wales.—FIELD-WORK—Mr. H. B. Woodward reports that in accordance with the scheme of work for 1901, which was approved by the Board, the ground to be surveyed was arranged in three areas under the District Geologists:—

1. Midland district under Mr. Fox-Strangways.
2. Southern district under Mr. Clement Reid; and
3. South Wales district under Mr. A. Strahan.

1. Midland District.—Mr. Fox-Strangways, with the assistance of Mr. W. Gibson, Mr. T. I. Pocock, Mr. C. B. Wedd, Mr. J. A. Howe, and for a short time of Mr. G. Barrow, has surveyed an area of 289¾ square miles with 1445 miles of geological boundary-line in parts of Staffordshire, Cheshire, Derbyshire, and Leicestershire.

The surveys of Sheets 110 (Macclesfield) and of 141 (Derby and Loughborough), and that of the Cheadle Coalfield in Sheet 124, have been completed.

Mr. Wedd spent some time in Skye in order to carry on the Jurassic work which he commenced during the previous year. Mr. Howe, who joined the staff at the beginning of June, had previously had so excellent a training that he has been able to survey a large area during his first year of service.

2. Southern District.—Mr. Reid, with the assistance of Mr. W. A. E. Ussher, Mr. J. B. Hill, and Mr. E. E. L. Dixon, has surveyed an area of 93 square miles with 530 miles of geological boundary-line in Cornwall and Devon.

The survey of Sheet 351 (Penzance) has been completed except as regards the mining information. It had been expected that another geologist specially qualified to collect this information would have been appointed to the staff. In the absence of this help the final preparation for publication of Sheets 351 and 352 is necessarily delayed.

It was not found possible to extend the Survey into Sheet 346 (Newquay). Sheet 352 (Falmouth) was proceeded with, but Mr. Hill was unfortunately prevented by ill-health from making as much progress as was anticipated. The mining information will have to be collected and about 86 square miles surveyed before this Sheet will be ready for publication.

3. South Wales District.—Mr. Strahan, with the assistance of Mr. R. H. Tiddeman, Mr. B. S. N. Wilkinson, Mr. T. C. Cantrill, and Mr. H. H. Thomas, has surveyed an area of 105¼ square miles with 650 miles of boundary-line, in Glamorganshire and Carmarthenshire. The survey of Sheet 247 (Swansea) has been completed, while that of Sheet 230 (Ammanford or Cross Inn) and of Sheet 246 (Worm's Head) have been proceeded with. Mr. Thomas, who was appointed later than had been expected, joined the staff early in September; he has surveyed a small area, but the completion of Sheet 230 was impossible.

The total area surveyed in England and Wales amounts to 488 square miles with 2625 miles of geological boundary-line, being on an average more than five miles of boundary to the square mile.

In addition to the ordinary Field-work, special examinations have been made of new railway cuttings: those from Axminster to Lyme Regis, and from Alderton to Wootton Bassett were noted by Mr. Woodward; and those along a new railway near Crowle and Epworth by Mr. Gibson.

Through the courtesy of Mr. James Mansergh, President of the Institution of Civil Engineers, Mr. T. C. Cantrill had the opportunity of examining the sections along the course of the aqueduct of the Birmingham Corporation Waterworks from Rhayader to Frankley; and, by kind permission of Mr. A. McDonald Cobban, Mr. Gibson was enabled to examine a series of cores from a deep boring at Scunthorpe in Lincolnshire.

Indoor work.

INDOOR WORK.—In preparing the description of Sheet 123 (Stoke-on-Trent) it has been found impossible to condense the information within the limits of an ordinary Sheet Memoir. It is accordingly proposed to issue a district memoir on the North Staffordshire Coalfield, which extends beyond the limit of the sheet, and to prepare a much shorter sheet memoir. Both memoirs will be completed early this year.

The memoir on Sheet 156 (Leicester) has been completed by Mr. Fox-Strangways and is now in the Press.

The memoir on Sheet 314 (Ringwood) was completed by Mr. Reid; it has been printed, and will be issued early this year, as soon as the map is ready.

The memoirs on Sheet 298 (Salisbury), 317 (Chichester and Midhurst), 350 (Torquay), and 355 & 356 (Kingsbridge and Start Point) are still in hand.

The Memoir on Sheet 263 (Cardiff) was finished by Mr. Strahan and Mr. Cantrill, and has been set up in type. The memoirs on Sheets 231 (Merthyr Tydvil), 248 (Pontypridd), and 262 (Bridgend) are in hand.

The General Memoir by Mr. Jukes-Browne on the Cretaceous Rocks of Britain, Vol. II, has been set up in type, and proofs are being corrected. Further proofs in pages of the Memoir on the Geology of the Isle of Man have been received.

The Geological Survey are much indebted to Mr. H. W. Monckton, who kindly volunteered to edit the Memoir on the Geology of Reading in Explanation of Sheet 268, from the MSS. left by the late Mr. J. H. Blake. This has been accomplished and the Memoir will shortly be ready for the printer.

Colour Printing of Maps.

The Director General of the Ordnance Survey early in the year prepared an experimental colour-printed map of part of Hampshire, Sheet 330, according to a scheme devised by Mr. Clement Reid. It was proposed to have particular patterns for the different geological sub-divisions, and to employ the same colour for a series belonging to one geological system. The scheme did not prove to be quite so satisfactory as had been anticipated, and another trial in flat colours, corresponding with those used on our one-inch hand-coloured maps, was made. The Director General on this occasion took the new map, Sheet 123 (Stoke-on-Trent) and printed two editions, Drift and Solid. The results have been so satisfactory, that this plan will be followed with other one-inch colour-printed maps.

Transfer of Stock of Publications

The work of the London Office has undergone considerable re-arrangement. In the early part of the year it was decided to transfer the issue of all Geological Survey Publications to the Ordnance Survey. Hitherto the Maps and Sections had been received at the Geological Survey Offices, thence they were sent to the Colourists, and when returned they were passed on to the authorised agents, who accounted to H.M. Stationery Office. It was arranged that from 1st April the Ordnance Survey should deal with the Agents, but that the stock of Memoirs as well as the Maps and Sections should be held in the Geological Survey Offices and be supplied to Agents on demand from the Ordnance Survey. This arrangement was not found to be satisfactory, and it was subsequently decided that the sale stock of Memoirs and the sale and presentation stock of Maps and Sections should be held and be dealt with by the Ordnance Survey, which Department has also undertaken the work of supplying the Colourists with plain Maps and Sections. In consequence of this arrangement the entire sale stock of Maps and Sections, and all but the presentation stock of Memoirs, were transferred to Southampton at the end of September. The Geological Survey are greatly indebted to the Director General of the Ordnance Survey for the assistance he has rendered to us in carrying out these transfers, and in all matters relating to the publication of our geological maps.

The task of checking the maps and sections received from the Colourists has always caused considerable difficulty. This work has now been undertaken by the Ordnance Survey.

Applications for Geological Information.

Applicants for information hitherto came into the Map Office where the draughtsmen work. It has now been arranged that a set of the published Maps and Sections be kept in the Library and that all visitors go there to consult them. Other enquiries, personally and by letter, have been made to various members of the Staff, and more particularly to the Office in Jermyn Street. The majority of them relate to questions of Water-supply in various parts of the country, others relate to Soils and Sites for houses, to Drainage and to questions relating to Coal, Limestone, Sand, Fireclay, &c.

Information has been supplied to the Local Government Board on various Sanitary questions, and reports have been written for the Foreign Office on certain Minerals, and for the Colonial Office on Trinidad Coal.

Some attempt has been made to carry on the work of registering all the records of Borings and Well-sinkings which was commenced in 1895 ; but much remains to be done.

The Geological Survey are indebted to Mr. Whitaker for a number of records of Well-sections, and also for many Geological Pamphlets which he has presented to the Survey Office. Other records of Borings have been given by Well-sinkers and Engineers in return for information supplied to them.

Publications in 1901.

The following is a list of the Maps, Sections, and Memoirs issued by the Geological Survey of England and Wales during the past year :—

i. *Maps.*

ONE-INCH MAPS (NEW SERIES).

Sheets 261 and 262 (Bridgend) in one Map. Two editions with and without Drift. By R. H. Tiddeman and T. C. Cantrill.

The following one-inch New Series Maps are being colour-printed :—

Sheets 123, 232, 249, 314 ; and the following are in the hands of the Engraver—Nos. 156, 298, 317.

ONE-INCH TO FOUR MILES (INDEX MAP) NEW EDITIONS.

Sheets 8 and 11 revised, Sheet 12 reprinted.

SIX-INCH REFERENCE MAPS.

Duplicate Copies of Six inch Maps.

Forty-nine MS. Coloured Copies of six-inch sheets and quarter sheets have been made from the field copies and deposited in the Office for public reference. These are as follows :—

Berks, 9 N.W., N.E., S.W., S.E. 16 S.W.
Brecon, 37 N.W., S.W.
Bucks, 41 N.E., S.W., S.E. 46 N.W., N.E., S.W., S.E.
Carmarthen, 35 S.W. 42 N.E., S.E. 43 N.W., S.W.
Dorset, 21 S.E. 31 S.W. 40 S.W.
Glamorgan, 7 S.E. 8. 14 N.E. 15. 24.
Leicester, 18 N.W., N.E. 19 S.W. 27 S.W. 33 N.E. 38 N.E.
Oxford, 40 N.W., N.E., S.W., S.E. 45 N.W., N.E., S.W., S.E. 46 N.W., N.E., S.W., S.E. 50 N.W., S.W.
Rutland, 4 N.E.
Wilts, 69.

ii. *Vertical Sections.*

Three Sheets of Vertical Sections have been published :—

Sheets 84 and 85 of Shafts in the South Wales Coalfield.
Sheet 86 of Shafts in the North Staffordshire Coalfield.

iii. *Memoirs.*

Memoirs.

Summary of Progress of the Geological Survey of the United Kingdom for 1900, pp. 221. Price 1s. 0d.
Guide to the Geology of London. By W. Whitaker. Edition 6, pp. 102. Price 1s. 0d.

The following Memoirs are in different stages of progress :—

The Geology of the Isle of Man. By G. W. Lamplugh. *(Part in page proof.)*
The Cretaceous Rocks of Britain. Vol. 11. By A. J. Jukes-Browne, with contributions by William Hill. *(In slip proof.)*
The Water Supply of Berkshire. By J. H. Blake, with contributions by William Whitaker. *(Nearly ready.)*
The Geology of the Country around Exeter. By W. A. E. Ussher, with notes by J. J. H. Teall. *(Ready for publication.)*

The Geology of the Country around Southampton. By Clement Reid. *(Ready for publication.)*

The Geology of the Country around Kingsbridge and Salcombe. By W. A. E. Ussher. *(In preparation.)*

The Geology of the South Wales Coalfield. Part 3. The Country around Cardiff. By A. Strahan and T. C. Cantrill. *(In slip proof.)* Part 4: The Country around Pontypridd. By A. Strahan, R. H. Tiddeman, and W. Gibson. *(In preparation.)* Part 5, The Country around Bridgend. By R. H. Tiddeman and T. C. Cantrill. *(In preparation.)* and Part 6, The Country around Merthyr Tydvil. By A. Strahan, W. Gibson, and T. C. Cantrill. *(In preparation.)*

The Geology of the Country around Reading. By the late J. H. Blake. Edited with the assistance of H. W. Monckton. *(Nearly ready.)*

The Geology of the Country around Torquay. By W. A. E. Ussher. *(In preparation.)*

The Geology of the Country near Leicester. By C. Fox-Strangways. *(Part in slip proof.)*

The Geology of the Country around Ringwood. By C. Reid, with notes by F. J. Bennett and E. E. L. Dixon. *(In page proof—nearly ready for publication.)*

A thoroughly revised list of the publications of the Geological Survey and Museum is in preparation.

Petrographical Department. — In March Dr. John S. Flett Lecturer on Petrology in the University of Edinburgh, was appointed to undertake petrographical work. He proceeded to Edinburgh to investigate the rocks of Sheets 38 and 85, Scotland, and to obtain details of their geological relationships and mode of occurrence. Field visits were made to the areas in question in June and in August, and a petrographical chapter has been completed for the Explanation to Sheet 85, while a special report has been submitted on Sheet 38. In November he returned to London, where the remainder of the year's work was carried out.

The total number of thin sections of rocks added to the Petrographical Collection at Jermyn Street during the past year is 974. Of these, 109 are from rocks collected in England, 801 from Scotland, and 64 foreign. The English collection of rock slides now numbers 3,452, the Scottish 10,123, and the foreign 550.

During the nine months from April to December Dr. Flett has supplied 394 detailed microscopic descriptions of rock slides to the field officers. In addition to these 266 rocks have been studied and described in connection with the Memoirs in hand. This makes a total of 660 descriptions.

In November Dr. Flett visited Cornwall to obtain information and material for petrographical work on the district now being re-surveyed under the charge of Mr. Clement Reid. The investigation of the Cornish rocks will be proceeded with early in the present year.

During the past year Dr. Pollard has carried out many rock and mineral analyses. His work has been greatly facilitated by the appointment of a General Assistant in the Laboratory. In August he visited Swansea and conferred with Mr. C. A. Seyler, B.Sc., F.I.C., &c., Public Analyst for the Counties of Carmarthenshire, Glamorganshire, and Pembroke, and District Agricultural Analyst for the County of Glamorgan, with reference to the analyses of coals from the South Wales coalfield. As a result of this conference, it was decided to carry out a series of ultimate analyses, and the analyses of the first ten samples were completed before the end of the year.

The renovation of the Jermyn Street front of the museum in 1899 gave Dr. Pollard the opportunity of collecting specimens illustrating the mode of weathering, under the influence of the London atmosphere, of the magnesian limestone of which the museum is built. He has completed the examination of these specimens during the present year, and the interesting results of this investigation will be published in the *Summary of Progress.*

Owing to the increasing demand for chemical work it has been found necessary to provide additional accommodation. This has been done by

fitting up a bench in the gallery leading to the small existing laboratory, where it is hoped that Dr. Pollard will be able to work pending the construction of the new laboratory at the top of the buildings about to be erected on the west side of the Museum.

The thanks of the Geological Survey are due to Mr. C. A. Seyler for the assistance he has rendered in connection with the analyses of coals from the South Wales coalfield.

PALÆONTOLOGICAL DEPARTMENT.—Mr. Newton reports that during the year upwards of 800 new fossils have been added to the collection already in the museum cases. Many of these have been presented, while others have been purchased or collected by the officers of the Survey. Among these may be mentioned the nearly complete skeleton of a large bear from the peat of Bourne, Lincolnshire, presented by Mr. H. Goodyear, and a remarkably fine example of the rare coral from the Chalk (*Synhelia sharpeana*), from the collection of the late Mr. T. D. Bott, and forming part of the series presented by Mrs. Arthur Bott. Another rare specimen is the "Mandibular tooth" of *Edaphodon Bucklandi*, from the Brackleshам beds of Goldsworth Hill, presented by Mr. E. A. Ogilvie. A series of uncommon Jurassic Brachiopoda, purchased from Mr. S. S. Buckman, is also worthy of mention.

A detailed list of the donations will be found in the appendix, page 90.

The nomenclature of the Palæozoic Echinodermata in the Museum cases has been revised, including those from both Wenlock and Carboniferous rocks; and similar revisions have been made of the Palæozoic Phyllocarida, chiefly from Ludlow rocks. The Jurassic plants, chiefly from the Inferior Oolite have likewise been revised. During each of these revisions Mr. H. A. Allen has taken the opportunity of preparing catalogues of the type and figured specimens, and these it is proposed to have printed as an Appendix to the *Summary of Progress*. A similar catalogue of the Pliocene and Pleistocene figured specimens was prepared by Mr. Allen early in the year, and this was published as an Appendix to the *Summary of Progress* for 1900. The nomenclature of the Carboniferous *Cephalopoda* has been revised by Dr. F. L. Kitchin, and the Silurian *Gasteropoda* and the Cretaceous *Modiolas* have been similarly revised.

The Lower Greensand *Cephalopoda*, contained in Wall Case XI, have been re-arranged and catalogued. The Chalk Rock Fossils have been removed from the Middle Chalk Series and re-arranged with the fossils from the Upper Chalk.

During the year the following fossils have been received from the Officers of the Survey and entered in the books of the Department:—

Devonian fossils from near Plymouth, collected by Mr. W. A. E. Ussher; Carboniferous specimens, from Brecknock and Yorkshire, collected by Mr. T. C. Cantrill and Mr. J. Rhodes; Coal Measure fossils, from Staffordshire, obtained by Mr. W. Gibson; a few fossils, probably of Ludlow age, from Cefn Bryn, Gower, sent by Mr. R. H. Tiddeman; Lias and Rhætic fossils from Glamorganshire sent by Mr. Cantrill; Jurassic specimens collected by Mr. C. B. Wedd; Corallian and Oxford Clay fossils from the Dover shaft, obtained by Dr. F. L. Kitchin; Cretaceous Cherts from Skye, sent by Mr. C. T. Clough; Chloritic Marl and Gault fossils from Mupe Bay, Dorset, collected by Messrs. A. Strahan, W. Hill, and A. J. Jukes-Browne; Chalk fossils from Dorset, collected by Mr. E. Dixon; Eocene fossils from Wilts, Hants, and Dorset, collected by Mr. Clement Reid and Mr. Dixon; Weybourn Crag and Norwich Crag fossils from Norfolk and Suffolk, collected by Mr. Clement Reid and Mr. J. J. H. Teall; and Pleistocene (glacial) shells from Inchlonaig, Loch Lomond, sent by Mr. J. Horne.

Fossils have also been kindly lent for Survey purposes by Mr. J. B. Hue, from the Lower Greensand, near Sandown; and by Miss Gardiner from the Norwich Crag of Southwold.

All the above-named fossils have been examined and, as far as possible, specifically determined, short reports or lists of species being supplied to the officers requiring them. The determination of the Devonian fossils collected by Mr. Ussher and mentioned in last year's report has been completed and a preliminary report furnished to him.

The collection of Ordovician fossils kindly lent by Mr. V. M. Turnbull has occupied much time during the year, and about two-thirds of these have been named; it is hoped that the task will be completed within the next few months.

A series of fossil fishes from Ayrshire and Lanarkshire has been received from the Scottish Survey for exhibition in the Jermyn Street Museum.

A large series of Jurassic fossils collected by Mr. D. Tait in Skye has been received, but their determination remains to be accomplished in the coming year. There is, likewise, a series of remarkable Gasteropods obtained by Mr. R. H. Tiddeman from the Carboniferous limestone of Oxwich Head, Glamorgan, awaiting careful examination.

The following lists of fossils, prepared for Geological Survey Memoirs, have been examined and corrected:—

A list of Carboniferous fossils from Arran for the Memoir on that Island; a list for Mr. Fox-Strangways' Memoir on Leicestershire; several lists kindly supplied by Mr. J. Ward of specimens in the Cardiff Museum, for Mr. A. Strahan's Memoir on the Geology of Cardiff; a list of Glacial shells from Elie, Fife, to be used in Sir A. Geikie's forthcoming Memoir on the geology of Eastern Fife.

Proofs of the palæontological portions of the following Memoirs have been corrected for press:—

The "Guide to the Geology of London" (6th edition), by Mr. W. Whitaker; the "Geology of Southampton and of Ringwood," by Mr. Clement Reid; and the *Summary of Progress*, especially the appendices, or catalogues of Type fossils in the Museum. The proof of the Memoir on the "Cretaceous Rocks of Britain," vol. ii., by Mr. A. J. Jukes-Browne, is now passing through the press.

The re-arrangement of the stores of fossils collected in past years by the Survey Officers has been carried on with vigour during the latter half of the year. Some 600 trays of fossils have been cleaned and re-arranged in numerical order, the trays being numbered and labelled for easy reference in the office books. All these collections have now been re-arranged. This very necessary piece of work was greatly facilitated by the appointment of a Fossil Collector.

The collection of fossils continues to be largely used by workers in palæontology, and much of the officers' time is occupied in assisting those who desire to make a detailed study of specimens, and in attending to the increasing number of inquirers.

Museum of Practical Geology.—Mr. Rudler, the Curator and Librarian of this Museum, reports that the number of visitors to the Museum of Practical Geology during the year which ended on 31st December, 1901, was 55,543. This number represents 36,054 visitors on week-day mornings, 11,034 on Monday and Saturday evenings, and 8,455 on Sundays. The total number of visitors during the preceding year was 56,464.

A list of Donations to the Museum during the past year is appended. Among these, the most notable is a large collection of polished Indian Agates, presented in the early part of the year by Mr. Lennox Boyd. Attention may also be called to a series of minerals from Victoria, presented by the Department of Mines through the Agent-General.

In view of the removal of the Offices of the Geological Survey, on the expiration of the tenure of the adjacent premises in Jermyn Street in the course of the present year, measures have been taken to provide for the accommodation of the Staff of the Survey in the Museum building. This has necessitated considerable alterations in the arrangement of the Museum.

The Library has received many valuable additions during the year, and the Collection of Geological Photographs has also been largely augmented. As before mentioned, an extensive collection of the Maps and Sections of the Geological Survey of Great Britain and Ireland has been transferred from the Survey Office to the Library, where visitors desirous of consulting them will find them more convenient of access.

Various Science classes and other educational bodies continue to make use of the Museum by means of organised visits, and the Curator has given several Saturday afternoon demonstrations to Associations of this character.

Field Work

Scotland.—FIELD WORK.—Mr. John Horne reports that, in accordance with the scheme authorised by the Board of Education in March, 1901, the field work in Scotland was arranged in four districts in the Highlands, as represented in the Table appended to this report. Efforts were made to concentrate the work as much as possible in order to complete certain sheets specified in the scheme.

In the south-west Highlands (district I. of Scheme) the survey work was carried on under the supervision of Mr. Peach, F.R.S., with the assistance of Mr. Grant Wilson, Mr. Kynaston, and Mr. Muff. The region in which operations were carried on extended from the Crinan Canal in the south to Loch Shiel and the head of Loch Eil in the north, in the counties of Argyll, Inverness, and Perth. The ground surveyed is included in the one inch maps 36, 37, 45, 53, 54 and 62. Of these sheets, 37 has been completed, and only about two square miles remain to be surveyed in 45. Mr. Peach and Mr. Kynaston endeavoured to finish the latter map, and their efforts would have been successful had not a heavy fall of snow, early in December, put an end to field work in that region. The total area surveyed in this district amounts to 132¼ square miles, with 1,440 miles of boundary lines, which gives an average of about eleven linear miles per square mile. During the summer months Mr. Peach was engaged in the office, doing palæontological work and preparing sections for the memoir on "The Geology of the North-west Highlands." Mr. Wilson was engaged during the spring and summer months in deer forest ground lying to the west of the Great Glen ; later in the season he removed to Kilmartin to assist Mr. Peach with the survey of the metamorphic rocks of that district. Mr. Kynaston shared with Mr. Peach the mapping of the remaining portion of the volcanic plateau of Lorne. After a short course of training in the field, Mr. Muff was able to undertake, with Mr. Peach's supervision, the survey of a small patch of metamorphic rocks near Kilmartin, and part of the island of Lismore.

The district north of the Caledonian Canal (District II. of Scheme) was under the supervision of Mr. Gunn, as district geologist, with whom were associated Mr. Clough, Mr. Hinxman, and Dr. Crampton. Mr. Horne also took part in the work. This district included the north part of Inverness-shire, the central and eastern parts of Ross-shire, a small part of the county of Sutherland, and parts of the Glenelg and Knoydart districts on the west coast. Work was carried on in one inch sheets 61, 71, 72, 83, 92, 93, and 102. Of these sheets 92 and 71 are completed.* The total area surveyed in this district amounts to 197⅛ square miles, with 1,171 miles of boundary lines, which gives an average of about six linear miles to the square mile.

In the month of May, Mr. Gunn, jointly with Dr. Crampton, carried on the work in the Strathvaich Forest, while he also completed a small area in the Fannich Forest. In June he assisted in the completion of that part of Inverlael Forest, comprised in Sheet 92, and in the Loch Broom district, during July, he also finished certain small areas. In the autumn Mr. Gunn worked in the Kincardine district of East Ross-shire on the shores of the Dornoch Firth. Mr. L. W. Hinxman, in the spring, surveyed part of the complicated ground in Ross-shire between Loch Garve and Strathconan. In June he was transferred to Loch Broom to assist in the survey of the Inverlael Forest ; but for the greater part of the year his work lay in Inverness-shire in the neighbourhood of Glen Strath Farrar and Glen Glass. Dr. Crampton, during the months of April and May, was stationed at Aultguish, whence he surveyed a part of the Strathvaich Forest. In the month of June he joined in the work of the Inverlael Forest, and for the remainder of the season his operations were confined to the upper part of Strath Rusdale, near Alness, and southwards as far as Loch Glass. In the autumn Mr. Horne completed the survey of certain small areas in the Fannich and adjacent forests.

In the Eastern Highlands (District III. of Scheme) the field work was carried on by Mr. Barrow, Mr. Wilson, and Mr. E. H. Cunningham-Craig, under the supervision of Mr. Horne, who acted as district geologist. This district embraced parts of the Atholl and Glen Feshie Forests in Sheet 64, and special areas which had to be re-examined in Sheets 55 and 65 in

* The Skye portion of Sheet 71 is referred to in connection with District IV.

Aberdeenshire and Perthshire. Of these Sheets, 65 is completed, and the re-examination of 55 is almost wholly done. Early in December the latter work was interrupted by a fall of snow, which put an end to further field work. The total area surveyed in this district amounted to 69¼ square miles, with 755 miles of boundary lines. From Falar Lodge, as a central station, Mr. Barrow mapped part of the Atholl Forest and re-examined certain areas previously mapped by himself and Mr. Dakyns. In the autumn he proceeded to Deeside to revise certain boundary lines in Sheet 65; and towards the close of the season he was stationed at Blairgowrie, whence he re-examined certain sections in view of the publication of memoirs on Sheets 55 and 56.

In the early part of the season Mr. Cunningham-Craig completed the mapping of the "Green Beds" in the district of Strath Tay. He then proceeded to the Glen Feshie Forest, and towards the close of the season he re-examined the tract between Pitlochry and Blair Athol in Sheet 55. In Strath Tummel, at the end of the season, Mr. Grant Wilson re-examined some ground previously surveyed.

In Skye (District IV. of Scheme), the field work has been carried on by Mr. Harker, Mr. Clough, Mr. Barrow and Mr. Wedd, under the superintendence of Mr. Peach, as district geologist. This district included a tract lying to the north-west of the Cuillin Mountains, together with the island of Soay, in one-inch sheet 70, and various small isolated areas of Secondary Rocks in sheet 71. These two sheets were completed last season. The total area surveyed in this district during the year amounts to 48 $\frac{9}{16}$ square miles with 551¼ miles of boundary lines. Mr. Wedd spent part of the season in mapping the isolated and highly complicated patches of Secondary rocks; and after his return to England, Mr. Barrow was detailed to complete the survey of the remaining patch of Secondary rocks in sheet 71.

The total area surveyed in Scotland during 1901 amounts to 447 $\frac{11}{16}$ square miles with 3,917¼ miles of boundary lines.

Petrographical Work.

INDOOR WORK.—The number of rock specimens gathered by the collectors during the past year has been 2,693, in illustration of the Geology of the Counties of Sutherland, Inverness, and Perth. A special feature of the work was the collection of several sets of specimens of the igneous rocks in Assynt and in Skye, under instructions from Mr. Teall and Mr. Harker respectively.

The following rock sections were examined with the microscope and descriptive notes written thereon by Mr. Kynaston. The sections were from specimens of Lower Old Red Sandstone volcanic rocks, partly belonging to the Jermyn Street collection, and partly new sections from Museum specimens:—

14	sections	illustrating	sheet	14	(Ayrshire)
2	„	„	„	24	(Peebles)
2	„	„	„	23	(Lanark)
52	„	„	,	32	(Pentlands, Braid Hills, &c.)
15	„	„	„	39	(Ochils, Perth)
1	„	„	„	40	(Ochils)
4	„	„	„	67	(Kincardine)

Notes were also written descriptive of Upper and Lower Old Red Rocks, collected in the northern part of the island of Arran by Mr. Gunn:—

3	sections	(Upper O.R.S.)	sheet 21
19	„	(Lower O.R.S.)	

Palæontological Work.

Mr. Peach, the Acting Palæontologist, has prepared the following summary of the Palæontological work done in Scotland during the present year.

Fossils to the number of 1,191 were gathered and entered in the Survey List Books. Of these Mr. Macconochie collected 20 from the Lower Old Red Sandstone of Fife and Dumbarton, 202 from the Carboniferous Rocks of Berwickshire, and 50 from the Post Tertiary Clays of Loch Lomond, while Mr. Tait collected 105 from the Upper Silurian Rocks of Lanarkshire, 96 from the Carboniferous Rocks of Fife and Arran, and 719 from the Secondary Rocks of the Isle of Skye. During the field season the

Fossil Collectors gathered 2,693 rock specimens, besides chips for microscopic examination, their time being thus much occupied.

Mr. Peach has made preliminary examination of some of the fossils for distribution among specialists.

Dr. Traquair has named the Ludlow, Downtonian, and Lower Old Red Sandstone fishes obtained during the season, to the number of 80, and described a new species of *Gyracanthus* from species obtained by Mr. Macconochie from the Calciferous Sandstone rocks of Berwickshire.

Mr. Kidston accompanied Mr. Tait during the spring to the shores of East Fife to collect Fossil Plants from the Lower Carboniferous rocks. The results of the examination have been supplied to Sir Archibald Geikie for insertion in the forthcoming memoir on sheet 41, East Fife.

Mr. Kidston in the autumn also accompanied Mr. Macconochie while collecting Fossil Plants from the Lower Carboniferous rocks of Berwickshire. They made an interesting discovery of pseudomorphs after rocksalt in some of the shales of the Calciferous Sandstone on the banks of the Whiteadder and Blackadder. Mr. Kidston has supplied valuable notes on the results of the examination of the Fossil Plants obtained by them for the Annual Summary of Progress.

In Skye, Mr. Tait, at the instance of Mr. Wedd, made collections of fossils from all the horizons from the Rhætics to the Oxfordian in order to fix the zones as represented in Skye. The collections have been submitted to Mr. Newton. A most interesting discovery of Cretaceous rocks was made by Mr. Clough beneath the Tertiary volcanic plateau on the shore, on the north side of Soay Sound, in Skye. The specimens have been examined by Mr. Newton, who is of opinion that the fossils denote a Greensand horizon, in which opinion Dr. G. J. Hinde concurs.

Lists of fossils were drawn up by Dr. C. B. Crampton and Mr. Tait under the supervision of Mr. B. N. Peach for the appendix to the memoir on sheet 41.

The thanks of the Survey are due to Dr. Traquair and Mr. Kidston for assistance in the determination of fossils.

Museum Work.—Mr. Goodchild, Curator of the Geological Survey Collections, in the Edinburgh Museum of Science and Art, reports that during the year the principal work done in the Geological Survey Gallery has been the re-arrangement of a large part of the collection of rock specimens and the intercalation amongst these of new specimens of interest collected by the Survey Officers or given by others. A large number of the specimens of fossils have been re-tabulated and the descriptions written anew. In the course of this work the figured specimens have received special attention. A number of specimens of fossils from the Clyde Beds have been mounted and placed on exhibition. In addition to this, the important work of arranging the part of the collection which is not exhibited has been carried on. These specimens are arranged primarily under their respective biological headings and secondarily under the number of the Ordnance Survey one-inch sheets, so as to be available for immediate reference for lists. The collection of rock specimens placed in the glazed cases beneath the maps has been catalogued with the special object of facilitating reference to such of the specimens as may be duplicated.

During the year the Third Edition of the Guide to the Geological Survey Collections was sold out, and a new edition was forthwith prepared and placed in the hands of the Director of the Museum for publication as before.

It is satisfactory to be able to report that the interest in the collections is well maintained, and that the Index collections, in particular, have been, as usual, much visited by students and others interested in the educational aspect of the collection.

Photographic Work. During the past year Mr. Lunn visited the Cuillin Mountains in Skye and Lower Strathspey and succeeded in taking 120 photographs illustrating the geology of those areas.

Maps Published and Engraving. Two sheets of the one-inch map have been published during the year, viz:—No. 21, including parts of Arran, Bute, and the Cumbraes,

and No. 38, embracing the districts of Loch Lomond, Loch Katrine and Callander. The following four sheets are in preparation :—Nos. 37, 55, 65 and 86.

Memoirs in Preparation.

The following Memoirs are in different stages of progress :—

1. The Geology of Lower Strathspey; by L. W. Hinxman and J. S. G. Wilson, with petrographical notes by J. S. Flett (at the printers).

2. The Geology of East Fife; by Sir A. Geikie, with palæontological appendix by B. N. Peach (MSS. finished and sections drawn).

3. The Geology of North Arran, South Bute, the Cumbraes, and part of the coasts of Ayrshire and Kintyre (sheet 21) by Sir. A. Geikie (Ayrshire Coast), W. Gunn (North Arran, Bute, and the Cumbraes), B. N. Peach (Kintyre Coast), with petrological chapter on Arran by A. Harker. (MSS. finished, illustrations nearly ready).

4. The Geology of the Loch Lomond and Loch Katrine Districts (sheet 38); by B. N. Peach, C. T. Clough, and E. H. Cunningham-Craig (MSS. finished; certain alterations required).

5. The Geology of Islay and Jura; by B. S. N. Wilkinson (MSS. nearly complete).

6. The Tertiary Igneous Rocks of Skye; by A. Harker (MSS. nearly complete; illustrations not ready).

7. The Geology of the North-West Highlands (MSS. incomplete; illustrations not ready).

8. The Geology of Kintyre (MSS. incomplete).

9. The Geology of the Country around Pitlochry (in hand).

Applications for Geological information.

Many applications have been made by the public at the Edinburgh office for geological information relating to water-supply, building-stones, limestones, coal-seams, ores, &c.

Field Work

Ireland.—Field Work.—Mr. G. W. Lamplugh, District Geologist, reports that in accordance with the scheme of work, which was approved by the Board, the mapping of the Drifts on the six-inch scale in the neighbourhood of Dublin was commenced in May by Messrs. J. R. Kilroe, A. McHenry, H. J. Seymour, and W. B. Wright, under his supervision. A total area of 156 square miles with 453 miles of geological boundary-line was surveyed.

The survey of the area represented by Sheet 112 (Dublin), was completed together with that of the slips of the Six-inch sheets which extended beyond the limits of the one-inch map.

Arrangements are now being made for the colour-printing of this map.

Indoor Work.

Indoor Work.—Much work has been done in re-arranging the stock of map Memoirs, and other material stored at the Dublin Office, in transferring the Sale Stock to the Ordnance Office, and in administrative work rendered necessary by the recent re-organisation.

Messrs. McHenry and Kilroe have had the correction of proofs, preparation of MS coloured copies and other duties in connection with the publication of revised editions of 50 sheets of the one-inch solid map, besides the usual indoor work in connection with the Drift Survey now in progress.

Information has been supplied in answer to enquiries made personally, and by letter, with reference to water-supply, and to the occurrence of coal, iron-ore, and other minerals of economic importance.

The following is a list of the revised one-inch Maps issued by the Geological Survey of Ireland, during the past year :—

Sheets Nos. 46, 61, 67, 79, 115, 117, 118, 125, 126, 127, 134, 135, 143.

New Editions of the following one-inch maps are in the hands of the colourist :—

Sheets Nos. 36, 48, 49, 58, 59, 60, 61, 68, 69, 70, 71, 72, 78, 81, 82, 91, 92, 101, 102, 111, 112, 120, 121, 124, 128, 129, 130, 133, 138, 139, 144, 145, 147, 148, 149, 154, 156, 157, 158, 159, 165, 167, 168, 169, 178, 179, 180.

A new edition showing drift in detail, of the following one-inch map is being colour-printed :—

Sheet 112 (Dublin.)

An Explanatory Memoir to accompany Sheet 112, is in preparation.

The following Tabular Statements are appended to this Report :—

I. Table giving an Abstract of the Work of the Geological Survey of England and Wales for the Year, 1901.

II. Table giving an Abstract of the Work in Scotland.

III. Table giving an Abstract of the Work in Ireland.

IV. Table showing the number of maps and sections issued by the Geological Survey of the United Kingdom to Agents up to 30th September, 1901.

Va. Table showing the Number of Geological Survey Maps and Sections issued by the Ordnance Survey to Agents, from 1st October to 31st December, 1901.

V. List of Donations to the Museum of Practical Geology, Jermyn Street, London.

VII. List of Donations to the Geological Collections in the Museum of Science and Art, Edinburgh.

Five Key Maps are also appended, giving

(1) The Sections of the Geological Index Map of England and Wales on the scale of 4 miles to an inch.

(2) (3) The Sheets of the Geological Maps of England and Wales (old series), and Ireland on the scale of 1 mile to an inch.

(4) (5) The published and unpublished Sheets of the Geological Maps of England and Wales (new series), and Scotland on the scale of 1 mile to an inch.

Table I.—England & Wales:—Abstract of Work during the Year 1901.

Counties in which the Survey has been engaged.	Surveyors.	No. of Square Miles Surveyed in the Year.	Miles of Boundary Traced.	Micro-scopic Slides Prepared.	Memoirs Published	One-inch Maps.			New Editions of Index Maps Published	Vertical Sections Published	MS Copies of 6″ Maps Deposited
						Published	Engraving	Being Colour-Printed.			
1. Midland District.											
Cheshire.	6	289¾	1445								
Staffordshire.											
Derbyshire.											
Leicestershire.											
2. Southern District.											
Cornwall.	4	93	530	974	2	1	3	4	2	3	49
Devon.											
3. South Wales District.											
Glamorganshire.	5	105¼	650								
Carmarthenshire.											
Totals		488	2,625	974		1	3	4	2	3	49

TABLE II. SCOTLAND:—ABSTRACT of WORK done during the Year 1901.

Counties in which the Survey has been engaged.	Surveyors.	Square Miles Surveyed.	Miles of Boundary Traced.	Rock Specimens Collected.	Fossils Collected.	Geological Photographs taken.	Maps.	
							Published.	Engraving.
DISTRICT, 1.								
Argyllshire, Inverness-shire, Perthshire	4	132½	1440					
DISTRICT, 2.								
Inverness-shire, Ross-shire, Sutherlandshire	5	197⅛	1171	2,693	1,191	120	2	4
DISTRICT, 3.								
Inverness-shire, Perthshire, Stirlingshire	3	60½	755					
DISTRICT, 4.								
Skye	4	48⅞	551½					
		447⅛	3,917½	2,693	1,191	120	2	4

TABLE III.—IRELAND.—ABSTRACT OF WORK DURING THE YEAR 1901.

County in which the Survey has been engaged.	Surveyors.	No. of Square Miles Surveyed in the year.	Miles of Boundary traced.	New Editions of one-inch Maps.	
				Published.	In hand.
DUBLIN.	5	156	453	13	47

TABLE IV.—Showing the NUMBER of MAPS and SECTIONS issued by the GEOLOGICAL SURVEY to the agents during the period from 1st January to 30th September, 1901.

Particulars	England.	Scotland.	Ireland.	Total.
Whole Sheets (1 inch to 1 mile) solid	347	396	409	1,152
,, ,, ,, drift	111	—	—	111
Quarter Sheets ,, ,, solid	1,735	—	—	1,735
,, ,, ,, drift	401	—	—	401
New Series Maps (1 inch to 1 mile) solid	188	—	—	188
,, ,, ,, drift	259	—	—	259
Index Maps, hand coloured (4 miles to 1 inch)	25	—	—	25
Index Maps, colour printed (4 miles to 1 inch)	457	—	—	457
County Maps (6 inches to a mile)	235	328	—	563
Horizontal Sections	383	25	3	411
Vertical ,,	176	40	—	216
Total	4,317	789	412	5,518

Table V.—Shewing the NUMBER of GEOLOGICAL MAPS and SECTIONS ISSUED by the ORDNANCE SURVEY, from October 1st to December 31st, 1901.

Particulars.	England.	Scotland.	Ireland.	Total.
Whole Sheets (1 inch to 1 mile) solid	81	125	-	206
,, ,, ,, drift	20	-	-	20
Quarter Sheets ,, ,, solid	203	-	58	261
,, ,, ,, drift	61	-	-	61
New Series Maps ,, ,, solid	53	-	-	53
,, ,, ,, drift	65	-	-	65
Index Maps, hand coloured (4 miles to 1 inch)	-	-	-	-
Index Maps, colour printed (4 miles to 1 inch)	82	-	-	82
County Maps (6 inches to 1 mile)	60	25	-	85
Horizontal Sections	40	6	1	47
Vertical Sections	30	6	-	36
Total	695	162	59	916

TABLE VI.

List of Donations to the Museum of Practical Geology, during the Year 1901.

Abbott, G., Esq., M.R.C.S., F.G.S.—Two specimens of Selenite from the Woolwich and Reading beds near Newhaven, Sussex.

Acland, H. Dyke, Esq., F.G.S.—Cores of rock from depths of 1,205 to 1,244 feet from the boring at Colwall, Herefordshire.

Bott, Mrs. E. M.—A series of fossils from Jurassic, Cretaceous and Eocene strata of various British localities, being part of the collection of the late T. D. Bott, Esq.

Boyd, E. Lennox, Esq.—Seven hundred and one completely polished, and one hundred and ninety partly polished specimens of "Cambay Stones," or Agates, &c.; collected by the donor's brother, the late W. S. Boyd, Esq., of Baroda, India.

Chrestien, F. F., Esq.—Five specimens of Mica from the Paris Exhibition of 1900, obtained from the district of Hazaribagh, Bengal.

Cobban, A. McD., Esq.—A sample of Anhydrite from a depth of 361 feet from the Urban District Council's boring at Scunthorpe, Doncaster.

Colonial Office.—A sample of Lignite from Trinidad, West Indies.

Coomára-Swámy, A. K., Esq., B.Sc., F.G.S.—Four specimens of Charnockite and other rocks from Ceylon.

Crowder, H. D. Esq., A.R.S.M.—A sample of coal from near Pisa Flores, State of Hidalgo, Mexico.

Dulau, Messrs. & Co.—A framed and glazed copy of a Table of British Strata, by Dr. H. Woodward, F.R.S., and H. B. Woodward, F.R.S.

Fowler, G. H., Esq.—A tooth of *Odontaspis macrotus*, from Barton Beds in Seymour's Brickyard, Ringwood, Hants.

Goodyear, H., Esq.—Remains of a large Bear from the Peat of Bourne, Lincolnshire.

Green, F., Esq.—A sample of the so-called Blood Rain which fell at Palermo on March 10, 1901.

Grey, F. W., Esq.—Auriferous Quartz showing the use of fire at a depth of 340 feet in the ancient workings of the Huth Mine, in the Deccan, India.

Gunn, H. H., Esq., A.R.S.M.—A specimen of Chrysocolla from Clifton, Arizona, and four Crystals of Orthoclase, a group of Orthoclase Quartz and Mica, and Crystals of Laumontite from the granite quarries of Baveno, Lago Maggiore.

Handcock, E. W., Esq.—A specimen of *Paludina sussexiensis* from the Wadhurst Clay of Markbeach, Edenbridge.

Hind, Wheelton, Esq., M.D., F.G.S.—A specimen of *Glyphioceras carbonarius* from the Lower Coal Measures, Halifax.

Holmes, W. M., Esq.—A tooth of *Carcharodon auriculatus* from the Bracklesham Beds of the railway cutting at Goldsworth Hill, Woking.

Jessop, H. J., Esq.—Native Gold on Mica, and with Tetrahedrite, from the district of Carabaya; and Hœmatite in talc, and two specimens of Tetrahedrite from Huancavelica, Peru.

Johnson, J. P., Esq.—A specimen of *Helix (Acanthinula) lamellata*, from West Wittering, Sussex.

Kidner, H., Esq.—Two specimens of *Thamnastrea* from the Great Oolite of Beacon Farm, Frampton Mansell, near Sapperton, Gloucestershire.

Lacaita, C. C., Esq.—A sample of the so-called Blood Rain which fell at Ravello, near Amalfi, Italy, on March 10, 1901.

Lamprey, J. H., Esq.—An ancient Stone Chisel found at Ballintemple, Croghan Kinshela, Co., Wicklow.

Mackie, W., Esq., M.A., M.D.—Two small specimens of Copper Ore from Kingsteps Quarry, Nairn, N.B.

Mason, S. J. Esq.—Pressed Brick and Tile with sample of the clay used, from Buttington, near Oswestry.

Mond, R. L. Esq., M.A., F.R.S.E., F.G.S.—Calcite in large crystals from Trelogan Mine, Flintshire.

MOON, E. I., Esq.—A sample of Coal from Toledo, Cebu, Philippine Islands.

MORENO, Dr. F. P.—A large polished slab of green Stalagmite, partly impregnated with iron oxides, from La Toma, San Luis, Argentina.

MORRIS, J. P., Esq.—Galena and Quartz veinstone from Bronfloyd Mine, Cardiganshire.

OGILVIE, E. A., Esq.—A series of Fish Teeth from the green sand bed of the Middle Bagshot, in the railway cutting at Goldsworth Hill, Woking; also a fine specimen of *Edaphodon Bucklandi* from the same locality.

PARSONS, H. F., Esq, M.D., F.G.S.—Specimens of *Solidula* and *Cerithium* from the Oldhaven Beds of Sundridge Park, Kent.

PATON, J., Esq., F.L.S.—Four crystals of Pseudogaylussite, dredged from the Estuary of the Clyde.

PERCEVAL, SPENCER G., Esq.—One rough and four polished specimens of Carboniferous Limestone, showing structure resembling that of Cotham Marble, from Knowle Quarry, near Pen Park Hole, and a sample of Landscape Marble from Windmill Hill, Henbury, Bristol.

PRICHARD, HESKETH, Esq., Stalactites in Limonite from Lago Rica, Santa Cruz, Patagonia.

REID, CLEMENT, Esq., F.R.S., F.G.S.—A *Lingula* and a *Spondylus dutempleanus* from the Upper Chalk of Triminghaim, Norfolk.

ROBBINGS, G., Esq.—A specimen of *Lingula mytiloides* and of *Fouquea cambrensis*, from the 4-foot seam in Llanbradach Colliery, South Wales.

SAM, T. B. F., Esq., C.E., F.G.S.—Two specimens of Auriferous Conglomerate, or "Banket," from the Wassau District, and several Stone Chisels from old Gold Workings in the Drift of The Gold Coast.

SAMWELL, N., Esq.—A Stone Adze from the Island of Celebes.

SHERBORN, C.D., Esq., F.G.S.—A specimen of *Serpulites* ? from Nellie's Cove, E. of St. Keverne, Cornwall.

SLADE, J., Esq., F.G.S.—A specimen of Millerite in Clay Ironstone from the Coal Measures of Rhonddha Valley, South Wales.

STANCLIFFE ESTATES CO., LTD.—Six dressed Cubes of Building Stone representing the Quarries of Stancliffe, Bentley Brook, Cromford and High Peak, and Hall Dale; Darley Dale, Derbyshire.

STEART, W., Esq.—Galena from the Coal-measures (Farrington Series), in the Braysdown Colliery, Radstock, Somerset.

STEPHENS, A., Esq.—A Jug in cream-coloured Earthenware, barrel-shaped, impressed, "Burton."

SWAIN, E., Esq., F.G.S.—A sample of Carnotite from Montrose, Co., Colorado, U.S.A.

THOMPSON, BEEBY, Esq., F.G.S.—A specimen of *Arietites difformis* from the Lower Lias of Evesham.

THOMSON, H. C., Esq.—Zinc Blende with Galena from Anzuola, Guipuzcoa, and Arsenopyrite from the Prov. of Salamanca, Spain.

TRECHMANN, C. O., Esq., Ph.D., F.G.S.—A specimen of Mirabilite from Kirkby Thorpe, Westmoreland.

VICTORIA, DEPARTMENT OF MINES OF (per the AGENT GENERAL).—A collection of fifty specimens, illustrating the Mineralogy of the Colony; also a series of specimens illustrating the Graptolites.

WALTON, H. E., Esq.—A Bird Bone, a Mammal Tooth, and a Fish Jaw from the Barton Series, of Barton, Hants.

WEBB, ASTON, Esq., A.R.A.—A specimen of London Clay containing *Teredo*, obtained in excavating foundation for central tower of the Victoria and Albert Museum, S. Kensington, S.W.

WETTON, JOSEPH, Esq.—Cubes of Sandstone from Bollington, near Macclesfield.

WHITAKER, W., Esq., F.R.S., F.G.S.—An *Ostrea bellovacina* from the Woolwich Series in the Greenwich Tunnel.

WICKES, W. H., Esq.—A specimen of *Sauricthys acuminatus* from the Upper Rhætic Beds of Redland, Bristol.

WILLIAMS, S. K., Esq.—Six specimens of Gold Quartz from the Barima River, British Guiana.

WILSON, A. D., Esq.—A sample of rich Gold Quartz from Dundas, West Australia, and of Botryoidal Phosphorite from Logrossan, Estremadura, Spain.

TABLE VII.

LIST OF DONATIONS TO THE GEOLOGICAL SURVEY COLLECTIONS IN THE MUSEUM OF SCIENCE AND ART, EDINBURGH, DURING THE YEAR 1901.

ARCHIBALD, STEWART, Esq.—Specimens of metamorphic and other rocks from the district around Tomatin.

BELL, RICHARD, Esq., of Castle Oer.—Specimens of Vitreous Dyke, Wat Carrick, Eskdale.

BENNIE, JAMES (Sons of the late).—The residue of the late Mr. Bennie's private collection of fossils and also about 150 pamphlets on scientific subjects.

LOVE, JAMES, Esq.—Large block of Kentallenite.

MATHIESON, Miss.—22 specimens of cut and polished fossil trees from Lennel Braes and Norham Bridge, Berwickshire, which belonged to the late Edward Mathieson, Esq., of Jedburgh.

REID, JAMES, Esq., Blairgowrie.—Specimens of old Red Sandstone plants from the neighbourhood of Cromarty.

STRACHAN, JAMES, Esq.—Portion of a stem of *Sigillaria*.

THOMSON, A. G. M., Esq., and J. G. GOODCHILD, Esq.—Rock specimens of Old Red Sandstone of Perth and Forfar.

WHYTE, PETER, Esq., C.E.—A specimen of *Lepidodendron* found during the excavations at Leith Docks.

YOUNG, DENHOLM, Esq.—Specimens of rocks from New Galloway and one from Shetland.

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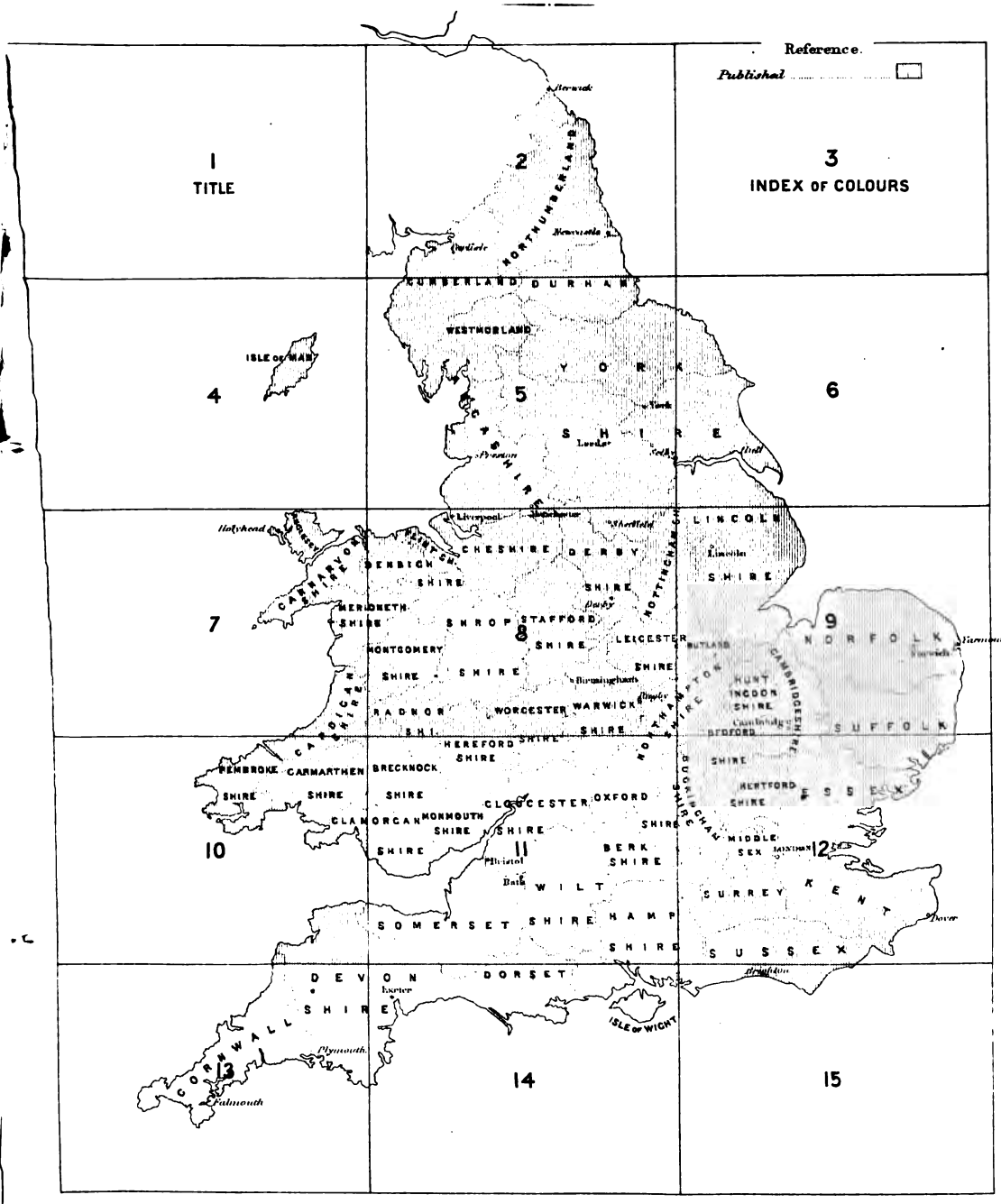

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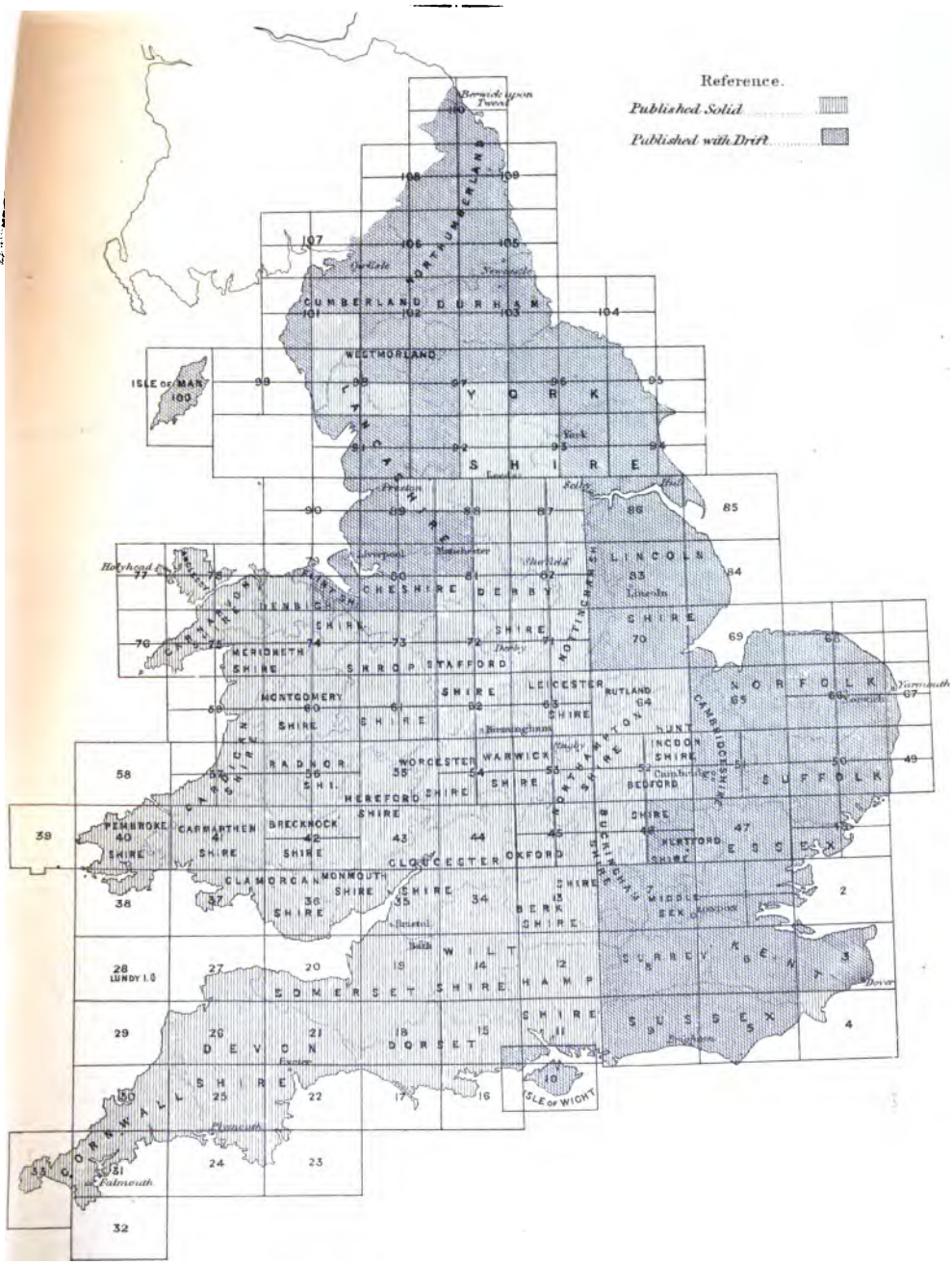

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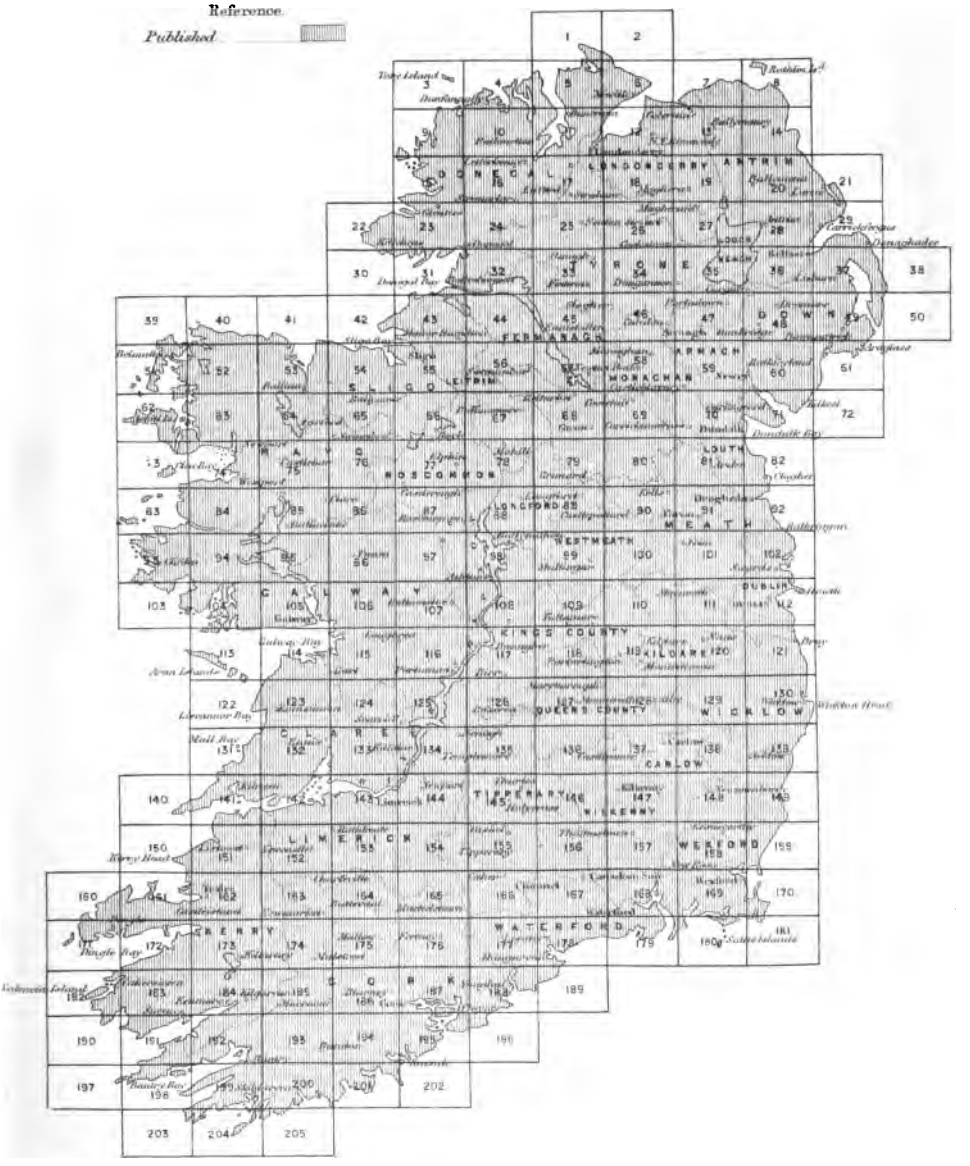

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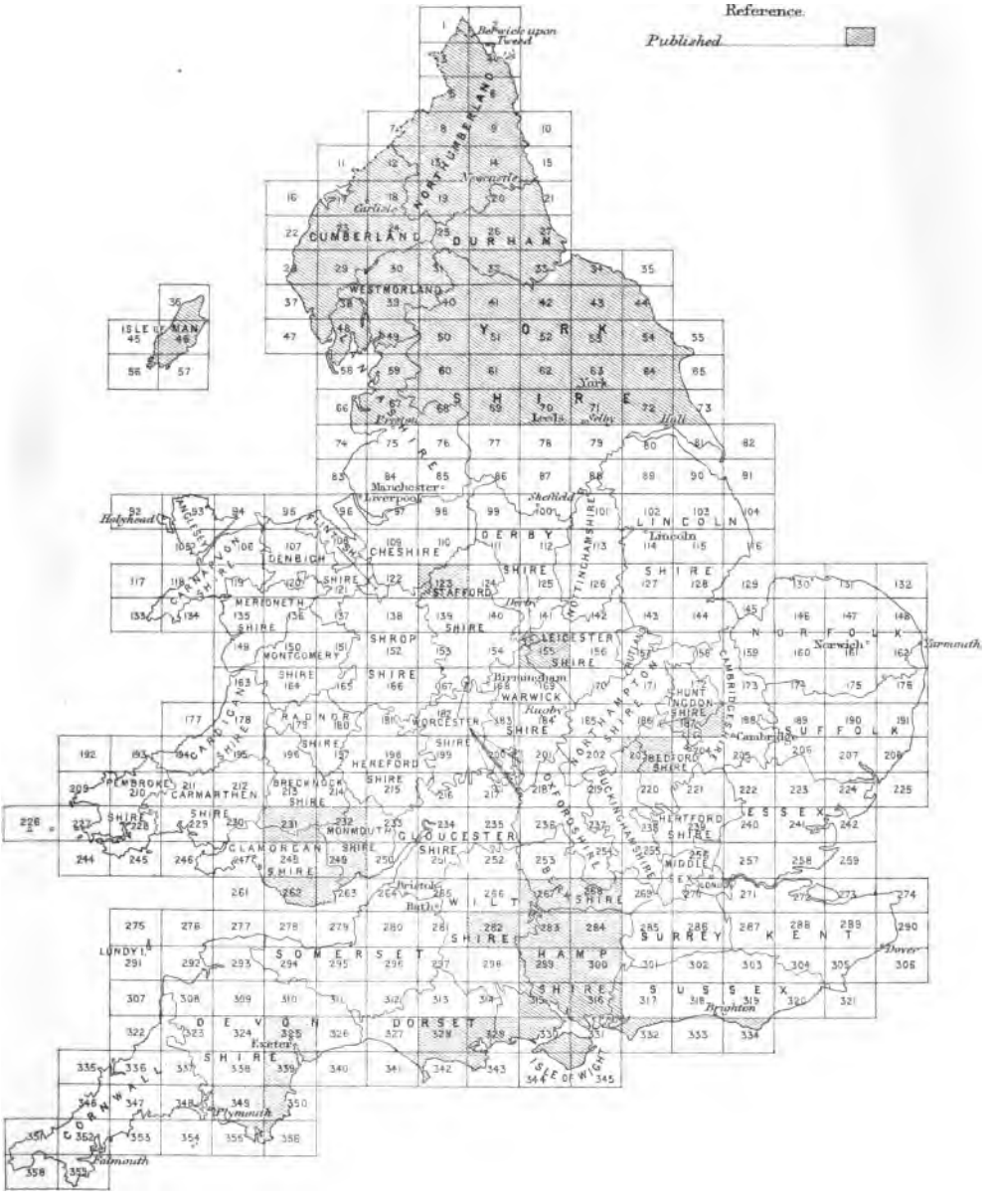

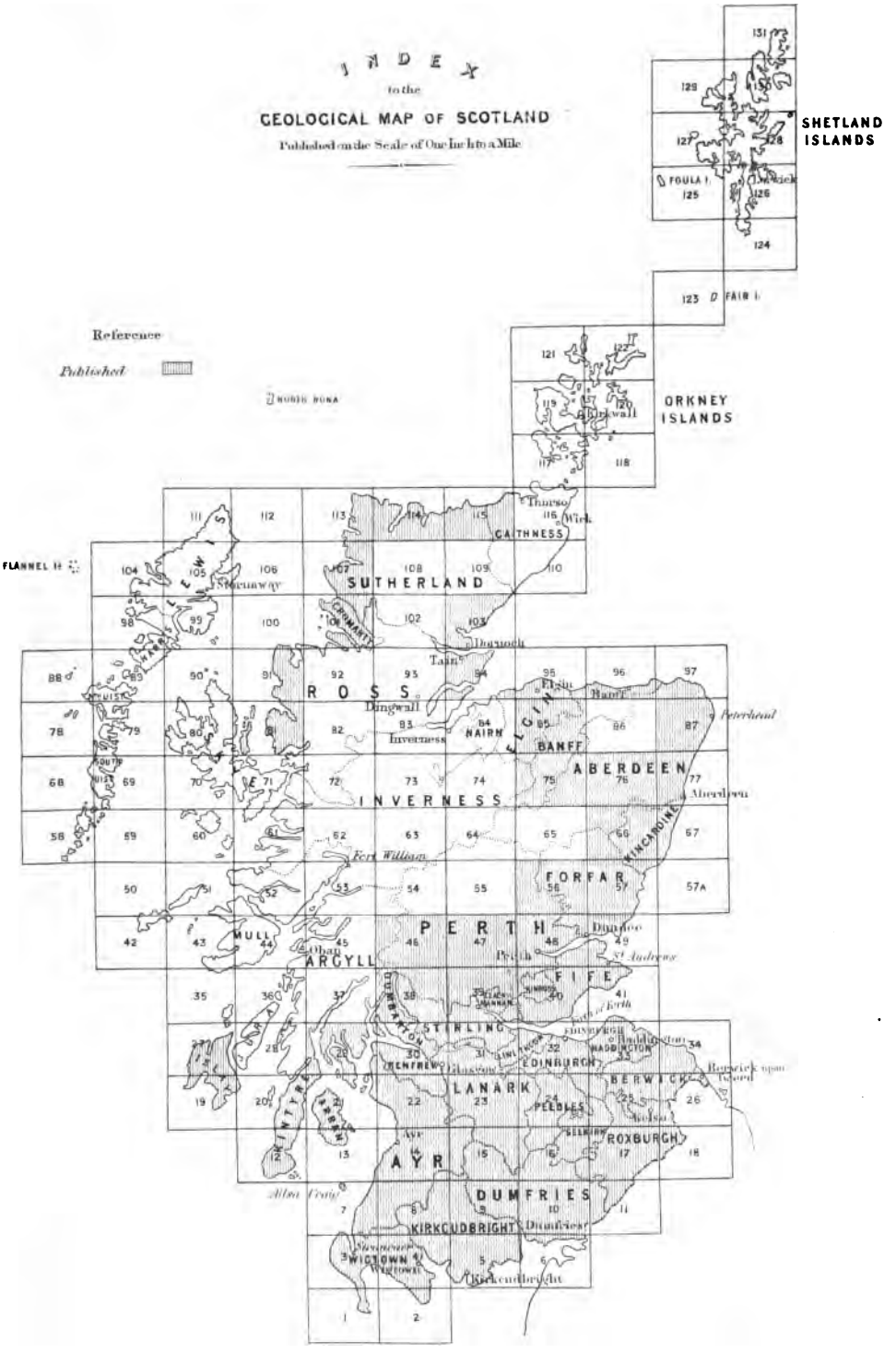
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SOLAR PHYSICS OBSERVATORY.

REPORT for the Year 1901, together with the last Three Months of the Year 1900.

N.B.—Owing to the re-organisation of the Observatory which was then in progress, the previous annual report could only be brought down to 30th September, 1900. This Report is therefore for a period of 15 months, taking up the work from the point where the previous report ends.

The Scientific Staff of the Solar Physics Observatory, South Kensington, is as follows:—

Director.—Sir J. Norman Lockyer, K.C.B., F.R.S.

Chief Assistant.—Dr. W. J. S. Lockyer, M.A., F.R.A.S.

Assistants—F. E. Baxandall, A.R.C.S.; C. P. Butler, A.R.C.S.; W. E. Rolston.

The position of the Observatory is:—

Lat. 51° 29′ 47″·98 N.

Long. 0° 10′ 23″·09 W. (41s. ·5).

Particulars of the instrumental equipment of the Observatory, and a plan showing the present distribution of the larger instruments are given at page 471 of the Forty-fourth Report of the Department of Science and Art.

In addition to the routine solar work done in the Solar Physics Observatory, in accordance with the scheme approved by the Solar Physics Committee, daily photographs of the sun are taken at the Dehra Dûn Observatory, Trigonometrical Branch Survey of India, of which Mr. J. Eccles, M.A., Deputy Superintendent Survey of India, is in charge, and at the Royal Alfred Observatory, Mauritius, under the direction of Dr. Meldrum, F.R.S. Daily observations of the widened lines in sunspot spectra are also being made at the Maharajah Takhtasingji Observatory, Poona, India, under the direction of Professor W. D. Naegamvala.

The positions of these observatories are as follows:—

Dehra Dûn, lat. 30° 19′ 29″ N.; long. 5h. 12m. 22s. ·8.

Mauritius, lat. 20° 5′ 39″ S.; long. 3h. 50m. 12s. 5E.

Poona, lat. 18° 28′; long. 4h. 59m. 8s. E.

The past and present work of the Observatory may be indicated under the following heads:—

(1) The organisation of observations of the sun at various parts of the earth's surface.

(2) The organisation and utilisation of a system of daily photographs at various obseratories, including Greenwich, on a larger scale than that hithe-to attempted.

(3) The collection and discussion of the earliest observations of solar spots since the employment of photography.

(4) The introduction of actinometric observation at great heights, and the discussion of the best means both of making and recording such observations.

(5) The spectroscopic observations of solar spots with reference to the chief lines widened in each.

(6) Discussion of the observations of sun spot spectra, with reference to the changes of temperature in each spot which has been observed several times.

(7) Laboratory experiments in connection with the observations made on the sun since the introduction of the new method.

(8) Discussion of photographic reductions of solar spots with reference to proper motions.

(9) The study of the Indian large-scale photographs of the sun, with reference to the motions in spots and the general surface of the sun.

(10) The organisation of eclipse observations and the discussion of the records obtained by them.

(11) Observations and photographs of the spectra of meteorites at various temperatures.

(12) Comparison of the spectra of meteorites, single and composite, with the solar spectrum, with the view of investigating the possible meteoritic origin of the sun, as well as of all other celestial bodies.

(13) Observations and photographs of the spectra of the various orders of celestial bodies, with a view of determining the true place of the sun amongst them.

(14) Comparison photographs of sun and arc-spectra, from ultra-violet to infra-red.

(15) New large scale maps of arc-spectra, Rowland's photographic map of the solar spectrum being taken as the standard. A new series of photographs has been taken in which the various substances were volatilised between silver poles, in order to facilitate the elimination of lines due to impurities. The adoption of this method has led to the discovery of a large number of lines not previously recorded.

(16) New maps of the spectra of iron, calcium, and other metals of the iron and calcium groups, from photographic comparisons.

(17) Photographs of the spectra of stars, with special reference to those about the same mean temperature as the sun.

(18) Photographs of the spectra of variable and new stars.

(19) Photographs of sun-spot spectra.

(20) Photographs of the sun in monochromatic light.

(21) Experiments on the gases obtained from minerals, and the discussion of their spectra in connection with the spectra of the sun and other celestial bodies.

(22) Observations and photographs of the spectra of different compounds of carbon, with the view of determining the true nature of the carbon which is known to exist in the sun's atmosphere.

(23) Observations of spectra which are visible at low temperatures, and comparisons of the same with the spectra of certain celestial bodies.

(24) Discussion of sun-spot spectra in relation to the latitude of the spots.

(25) Discussion of meteorological observations in relation to the observations of sun-spots and their spectra.

(26) Photographs of metallic and solar spectra with a Rowland grating, to investigate the want of absolute coincidence between certain solar and metallic lines, and to revise the existing maps and tables of the lines belonging to the more important metals.

(27) Photographic study of the spectra of metals at the highest possible temperatures attainable in laboratory experiments, and comparisons of the results with the spectra of the hottest stars and of the solar chromosphere photographed during recent eclipses.

I.—Laboratory Work.

(a.) *Rowland Grating.*

The spectra of the following elements have been photographed with the 6-inch Rowland concave grating, using the first order spectrum.

No.	Substance.	Description or Donor.	Region. λλ	Source of Temperature, and conditions.
1	Iron	Commercial	3800–4900	Arc.
2	Scandium	Oxalate (Clève)	„ „	„ silver poles.
3	„	„ „	4800–5900	„ „ „
4	Vanadium	Acid (Roscoe)	3800–4900	„ „ „
5	„	„ „	4800–5900	„ „ „
6	Lead	Commercial	3800–4900	Spark; 10″ coil, 1 gallon condenser; in air and water.
7	Silver	„	„ „	„ „
8	Copper	„	„ „	„ „
9	Zinc	„	„ „	„ „
10	Magnesium	„	„ „	„ „

(b.) *3-inch Cooke Spectroscope.*

The spectra of the following elements have been photographed with this instrument:

No.	Substance.	Description or Donor.	Region. λλ	Source of Temperature, and conditions.
1	Scandium	Oxalate	3800–6000	Spark; 10″ coil, 1 gallon condenser; platinum poles.
2	Silver (metal)	Sir W.C. Roberts-Austen.	„ „	Arc.
3	Magnesium	Commercial	„ „	Flame
4	Platinum	Pure metal	„ „	Arc.
5	Barium	Chloride	„ „	„ on silver poles.
6	„	„	„ „	Spark; on platinum poles.
7	Nickel (metal)	Matthey	„ „	Arc.
8	Cobalt „	„	„ „	„
9	Tungsten	Metal (black powder).	„ „	„ on silver poles.
10	Silicium	Oxide	„ „	„ „ „
11	Copper	Metal	„ „	„ copper poles.
12	Aluminium	„	„ „	„ aluminium poles.
13	Carbon	Vine charcoal	„ „	„ silver poles.
14	Yttrium	Oxide	„ „	„ „ „

In addition to these, about 90 photographs of the spectra of various rocks, plants, meteorites, &c., have been taken, in order to investigate the validity of the suggestion that the metals of the basic rocks were the same as those which form the absorbing atmosphere of the stars of intermediate temperature.

II.—Sun-spot Spectra.

(Kensington.)

(a.) *Observations.*

The sun has been observed whenever the weather permitted, and the most widened lines have been recorded in the spectra of 33 spots. From October 1st, 1900 to December 31st, 1901, inclusive, there have been, excluding Sundays, 391 days, and deducting one day on which the Observatory was closed on account of the funeral of the late Queen, we get 390 working days. The following is a digest of the Observatory note-book during this period :—

Month.	Bad Weather entirely prevented Observations.	Spots observed, but Spectra not recorded owing to bad Weather.	"No Spots" was recorded.	Spots recorded, but too small for Spectrum Observations.	Days on which Observations of Spot Spectra were made.	No. of Spot Spectra observed.
1900.						
October - - -	5	7	9	2	4	5
November - - -	15	1	7	8	0	0
December - - -	15	0	10	1	0	0
1901.						
January - -	15	0	12	0	0	0
February - - -	9	0	13	1	0	0
March - - -	11		11	0	0	0
April - - - -	5	0	21	0	0	0
May - - - -	8	0	15	0	9	17
June - - - -	1	4	15	0	5	5
July - - - -	5	0	21	1	0	0
August - - -	2	0	25	0	0	0
September - - -	8	0	17	0	0	0
October - - -	9	2	13	1	2	3
November - - -	13	2	7	1	3	3
December - - -	11	0	15	0	0	0
Totals - -	127	20	211	10	23	33
	390					

(b.) *Reductions.*

The volume giving the individual observations of the lines most widened in the first 2,000 spot spectra, mentioned in the last report, has now been published and distributed by the Committee.

The number of days on which "No Spots" was recorded is still large whilst the area of the spots is small, as it is about the minimum of the sun-spot cycle.

The widened lines now recorded are still, in the main, due to Vanadium, Titanium and unknown elements.

The numbers of widened lines of the individual elements observed in the widened line records from 1879 to 1901 have been abstracted, their percentages of the total number of recorded widened lines have been

computed, and curves, having for the co-ordinates time (in quarter years) and these percentages, have been plotted. The appearances of these curves bear out, in a striking manner, the widening of "metallic" lines in sun spots occurring at the minima of solar activity, and the widening of the "unknown" lines during the maxima. These results will be published in a paper referred to under the later heading of "Papers now in Hand.'

(c.) *Sun-spot Spectra.*

(Poona.)

Further observations of the widened lines recorded at the "Maharajah Takhtasinghi Observatory," Poona, have been received; the dates extend from September 1st, 1900, to December 31st, 1901.

During September the report states that "weather was unfavourable" every day, so that no spots are recorded for that month.

The observations for October are not complete, as during that period the new grating was being fitted, the lens was dismounted and cleaned, and bad weather prevailed on several days. From the end of October, 1900, to the end of December, 1901, the Poona records are more continuous.

The observations of widened lines have been made on 28 separate days, but, as on some days more than one spot was examined, the total number of separate spot observations is 37.

The following table gives a digest of the Poona observations for this period:—

Month.	Total No. of Days available.	No. of Days on which "widened line" Observations were made.	No. of Observations of "widened lines" in Separate Spots.	No. of days on which bad weather entirely prevented observations.	No. of Days when No Record.	Remarks.
1900.						
September	25	0	0	25	0	Cloudy weather prevented Observations.
October	27	0	0	0	13*	*New grating being mounted and new observer trained.
November	26	4	6	0	0	
December	26	0	0	1	4*	*24th–27th, inclusive, Christmas holidays.
1901.						
January	27	0	0	2	3	
February	24	3	3	0	3*	*Feb. 2 (Queen's funeral), 12th and 27th.
March	26	5	9	0	1*	*March 7th.
April	26	0	0	0	2*	*April 5th (Good Friday) and April 6th.
May	27	8	11	0	1*	*24th, Victoria Day.
June	25	1	1	14	0	
July	27	0	0	26	0	"Sun not visible" for 26 days. "No spots," 1 day.
August	27	0	0	24	1*	*Wednesday 28th Government holiday. "Sun not visible" throughout August.
September	25	0	0	8	3*	*5th, 16th and 19th Government gazetted holidays.
October	27	0	0	3	1*	*22nd, Government gazetted holiday.
November	26	7	7	2	3*	*9th, 11th and 12th, Government gazetted holidays.
December	26	0	0	5	2*	24th, 31st, inclusive Government gazetted holidays. "No spots," 16 days.
Totals	417	28	37	110	37	

III.—Night Work.

(a.) *30-inch Reflector.*

The 30-inch reflector has been in use nearly throughout the year, and is in good working condition. For the photographing of spectra, the Hammersley spectroscope has been used at the eye-end, and generally a dispersion of two prisms has been employed. The mirror was dismounted on November 28th, 1900, and sent away for re-silvering; it was returned and re-mounted on December 20th. Photographs of the spectra of the following objects have been obtained with this instrument:—

Andromeda	δ	Cassiopeia	γ	Pegasus	γ
,,	θ	Corona	ε	,,	π
,,	κ	Cygnus	P	,,	ξ
,,	λ	,,	52	Perseus	α
,,	μ	Leo	α	,,	β
,,	ο	,,	η	,,	ε
,,	π	,,	60	Taurus	ν
,,	υ	Orion	γ	Virgo	η
Aquarius	π	,,	ε	,,	ι
Aries	41	,, Nebula		,,	ν
Canis Maj.	α	Pegasus	ι		

In addition to the above-mentioned spectra, about 25 photographs of the spectrum of Nova Persei—in many cases having the spectrum of α Persei, ε Persei or γ Orionis on the same negative, for comparison—have been obtained with this instrument.

(b.) *6-inch Henry with one prism.*

(1) This instrument was in regular use up to the middle of June, when the clock had to be sent to Messrs. T. Cooke & Sons for repairs and overhauling. It was returned on September 30th, and the instrument was used regularly for the photography of stellar spectra until the end of the year.

The spectra of the following stars have been photographed:—

Aries	α	Gemini	β	Orion	ε
,,	β	,,	γ	,,	ζ
Auriga	α	Hercules	β	,,	ι
,,	β	,,	ζ	,,	κ
,,	θ	Leo	α	Perseus	α
Bootes	α	,,	β	,,	β
,,	ε	,,	δ	Scorpio	α
,,	η	,,	η	Taurus	α
Canis Maj.	α	Lyra	α	,,	β
,, Min.	α	,,	β	Virgo	α
Cassiopeia	ϰ	,,	γ	,,	γ
Cepheus	α	Ophiuchus	α	,,	ε
Cygnus	α	,,	γ	Ursa Maj.	α
,,	δ	Orion	α	,, ,,	ε
,,	ε	,,	β	,, ,,	ζ
Draco	γ	,,	γ	,, Min.	β

During the period February 25th—March 30th, when Nova Persei was bright enough for this instrument to photograph its spectrum, 10 photographs of the spectrum of this star were obtained.

The 10″ refractor has been in constant use since February, 1901, for

observations of the visual spectrum of Nova Persei, and, during the latter part of 1901, for the estimation of the Nova's magnitude.

(c.) *9-inch Prismatic Reflector.*

On the nights which have been sufficiently favourable for spectroscopic photography this instrument has been used for attempting to obtain the spectra of objects beyond the range of the 6-inch prismatic camera.

Photographs of the spectra of the following objects have been secured :—

Aquila	θ	Eridanus	β	Orion	θ
Auriga	α	Gemini	η	,,	χ^2
Bootes	α	,,	ν	Pegasus	α
,,	κ	Hercules	α	,,	ζ
,,	θ	Leo	ζ	Pisces	α
Cancer	γ	Libra	γ	,,	η
Canis Min.	α	Lyra	α	Perseus	β
,, ,,	β	,,	γ	,,	δ
Cassiopeia	ϵ	,,	κ	,,	ϵ
,,	η	Orion	α	,,	o
Cygnus	α	,,	β	Serpens	κ
,,	γ	,,	γ	Taurus	γ
Draco	α	,,	ϵ	,,	ϵ
,,	κ	,,	ι	,,	58
Draco	HIV 37	,,	$\lambda\phi^1\phi^2$	Virgo	η

In addition to these, 73 photographs of the spectrum of Nova Persei, at different stages of its development, have been secured. In all, 125 photographs of stellar spectra have been taken with this instrument since the last report.

It was found, early in June, that the mirror needed re-silvering. Advantage was therefore taken of the fact that the nights were too short for much work, and that the position of Nova Persei during the hours of darkness rendered the photographing of its spectrum at South Kensington impossible, to send the mirror to the Improved Electric Glow Company for re-silvering. For this reason the instrument was out of use from June 5th to August 8th, inclusive.

In consequence of the Board of Education requiring the ground on which the hut stood, the instrument had to be dismounted and the hut taken down. The latter has been rebuilt near to, and to the south of, the 30-inch reflector at the Queen's Gate end of the grounds, and the instrument has been re-erected and is now in course of adjustment. Advantage was taken of the time which elapsed before the house was again ready for the instrument, to send the mirror to the Improved Electric Glow Company for re-silvering.

(d.) *6-inch Dallmeyer.*

The 6-inch Dallmeyer doublet, which was dismounted for use on the Eclipse Expedition to Spain, has been remounted, the clock overhauled and repaired, and another camera adapted to the instrument. It is now in working order, and has been used for photographing the region about Nova Persei, some very satisfactory photographs having been secured.

(e.) *36-inch Reflector.*

The new clock for this instrument was received from Messrs. T. Cooke & Sons, of York, on April 29th, 1901, and placed in position : the various necessary adjustments were made on the instrument, but it was found

that one part of the clock did not perform its function properly, so this was returned to Messrs. Cooke on August 19th for the necessary alterations to be made. It was received again on September 30th, and still one or two minor adjustments were found to be requisite; therefore it was again returned to Messrs. Cooke. On its return on October 15th, it was found to work satisfactorily and the instrument has been used for obtaining long exposure photographs of the region about Nova Persei, some successful photographs having been obtained. Advantage was taken of the absence of the clock to send the mirror and flat to the Improved Electric Glow Company for re-silvering; these have been re-silvered and returned, and are now in position and adjusted.

Owing to the change of staff, Mr. A. Fowler, Assistant Professor of Physics, and Messrs. Shaw and Hodgson, demonstrators in Astro-Physics, in the Royal College of Science, have ceased evening attendance, and it has been impossible to fully utilise this instrument, as the available observers have been required to work other instruments. For this reason the instrument has had to remain unused on the few evenings that the meteorological conditions have been favourable for observational work. This same remark applies to the 9-inch prismatic reflector, to the 6-inch Dallmeyer equatorial, and, to some extent, to the 30-inch reflector

(f.) *Ultra-violet Spectroscope.*

Experiments have been made with a spectroscope containing a quartz-calcite optical system—used as a prismatic camera—to obtain stellar spectra extending further into the ultra-violet region of the spectrum than do those obtained with the ordinary instruments with glass prisms and lenses. The instrument used consisted of two quartz lenses fitted with 1½-inch calcite half-prisms and a 60° calcite prism, with a camera attachment, the whole being mounted on a base-board, and fastened to the 6-inch prismatic camera. Several experimental photographs of stellar spectra have been obtained. A new camera—the specifications of which are based on the results of these experiments—has been designed for this purpose.

(g.) *Meteors.*

Arrangements were made for a systematic observation of the November showers of 1900 and 1901 by the whole staff. Owing to the unsatisfactory meteorological conditions no results were obtained in 1900, whilst very few Leonids were seen in 1901, notwithstanding the fact that a close watch was kept during the hours of darkness in which the shower was calculated to take place. It has since been recorded that the shower of 1901 made its appearance after daylight on the morning of November 15, hence its non-observance here.

(h.) *Distribution of Instruments.*

Up to the time of the retirement of Messrs. A. Fowler, Shaw and Hodgson from participation in the night work, viz., November 15th, 1901, the instruments in use were disposed among the observers as follows, the observers for each instrument taking alternate nights :—

30-inch Reflector—Dr. W. J. S. Lockyer, Mr. A. Fowler.

6-inch Henry with one 45° prism—Mr. F. E. Baxandall, Mr. C. P. Butler.

9-inch Reflector with one prism—Mr. W. E. Rolston, with the occasional assistance of Messrs. H. Shaw and A. E. Hodgson, Teachers in Training, of the Royal College of Science.

Since that date they have been disposed in the following order.

30-inch and 36-inch Reflectors—Dr. W. J. S. Lockyer, Mr. C. P. Butler.

6-inch Henry, with one or two 45° prism or prisms and 9-inch Prismatic Reflector with one prism – Mr. F. E. Baxandall, Mr. Rolston.

(i.) *Observing Nights.*

The state of the weather for observing purposes, from October 1st, 1900 to December 31st, 1901, inclusive, is indicated in the following table :—

Month.	No. of Nights available.	No of Nights wholly bad.	No. of Nights Observers attended.
1900.			
October	27	6	21
November	26	18	8
December	25	15	10
1901.			
January	27	17	10
February	25	7	18
March	30	7	23
April	29	4	25
May	27	10	17
June	25	11	3
July	27	13	0
August	27	8	18
September	25	10	15
October	27	17	10
November	26	15	11
December	25	13	12
Totals	398	171	201

During the months of February, March, and April, 1901, several observers made special attendances on Sunday nights, in order to preserve continuity in the observations of Nova Persei. During the very short nights of the latter end of June, and all through July, the opportunity was taken of having the instruments overhauled and repaired. It was found necessary to send away the driving clock of the 10-inch refractor (which carries the 6-inch Henry objective prism) and part of the new clock of the 36-inch reflector, and as the 30-inch reflector needed adjustment, whilst the mirror of the 9″ Prismatic reflector wanted re-silvering, no night-work was attempted during this period. This accounts for the discrepancies between the numbers given for the months of June, July, and August.

IV.—Sun Photographs.

(a.) *Indian Photographs.*

8-inch pictures.

Since the date of the last report (Sept. 30 1900) 697 silver prints have been received from Dehra Dûn. The dates of these extend from August 9th, 1900, to December 4th, 1901.

No photographs could be taken at Dehra Dûn on the following dates

chiefly on account of bad weather, and consequently gaps are left in the Indian record :—

1900.—August 9, 10, 11, 22, 23, 24, 25, 30, 31.
September 1, 2, 3, 13, 14, 18, 20, 21, 27.
October 21.
November 15.
December 14, 17, 18, 22, 24.
1901.—January 1, 7, 8, 9, 13, 14, 15, 21, 24, 25.
February 2, 13, 18, 19, 22, 27.
March 7.
April 3, 11, 13, 17, 23, 27.
May 4.
June 13, 26.
July 7, 10, 11, 18, 20, 28.
August 1, 3, 4, 5, 6, 7, 11, 13, 14, 17, 20, 21, 22, 28, 29.
September 11.

The last batch of Indian prints was received on January 8th, 1902 ; 692 negatives have also been forwarded from Dehra Dûn.

12-inch pictures.

Only six 12-inch negatives and corresponding prints have been taken at Dehra Dûn and forwarded here. The dates of these are from May 23 to May 29, 1901.

(b.) *Mauritius Photographs.*

Since the end of September, 1900, 315 8-inch prints have been received from Mauritius. The dates of these extend from April 11th to July 31st, 1901. From these the gaps in the Indian series, up to July 31st, are filled up, with the exception of the following days :—

1900.—June 2, 17.
July 13, 29.
August 7, 11, 22, 31.
December 17.
1901.—January 13, 14, 15, 24, 25
February 27.
April 27.
May 4.

No photographs for the period April 27th—May 25th, inclusive, have been received from Mauritius. The break in the record is probably due to the dismounting of the instrument for the total Solar Eclipse of May 18th, 1901.

As the Mauritius prints already received up to the end of 1901 only extend to July 31st, 1901, the gaps in the Indian record in August, 1901 and onward may be filled up when the next batch arrives.

604 8-inch negatives, and 30 negatives taken during the partial eclipse of May 18th, 1901, have also been received.

(c.) *Ely Photographs.*

Three boxes of solar negatives, taken at Ely during the years 1863–1874 by the late Canon Selwyn, have been forwarded here from the Royal Society for reduction.

(d.) *Spectroheliograph.*

Experiments have been made with a roughly improvised instrument to determine the best form for a spectroheliograph, and an instrument, the form of which is based on the lines indicated by these experiments, has been designed. Some 70 or 80 photographs of the solar disc, in monochromatic light have been obtained during the experimental period.

V.—Instruments.

(*a.*) In addition to the list of instruments cited in the last report, the following are now at the disposal of the Committee*:—

One small resistance coil for 30 in. finder.	S.P.
One resistance frame for the spectroheliograph room.	S.P.
One E.P.S. accumulator cell.	S.P.
One E.P.S. accumulator cell.	R.C.S.

(*b.*) The following is a list of the lenses and mirrors in the keeping of, or in use at, the Observatory:—

Lenses.	Present Use.	Property of.
10-inch Cooke.	Equatorially mounted carrying 6 in. prismatic camera.	R.C.S.
9-in. Henry.	Dismounted.	S.P.
6-in. Henry.	As prismatic camera on 10 in. equatorial.	S.P.
6-in. Troughton.	Equatorially mounted for sun-spot spectra.	Greenwich.
6-in. Cooke photo-visual 20′.	Not in use since Eclipse, 1900.	G.G.C.
6-in. Cooke.	Dismounted: the mounting is in use for the 9′ Reflector.	L.
4-in. Cooke (transit).	Mounted permanently in transit room.	R.C.S
4-in. Cooke photo-visual 16′.	Sunspot spectro-photography.	S.P.
4-in. Cooke photo-visual 6′.	Dismounted: is being mounted on the new spectroheliograph.	R.C.S.
4⅛-in. De la Rue O.G.	Dismounted since Eclipse, 1896.	L.
3⅜-in. Cooke.	Sun spot spectro-photography.	L.
3½-in. Cooke photo-visual.	,, ,, ,,	S.P.
3-in. Dallmeyer 2A portrait.	Double star apparatus for students' use.	S.P.
3-in. Cooke photo-visual.	Laboratory table spectroscope.	S.P.
3-in. ,, ,,	,, ,, ,,	S.P.
3½-in. objective.	Finder on 10-in. Equatorial.	R.C.S.
34-in. × 34-in. Dallmeyer rectilinear.	Mounted equatorially for celestial photography	R.C.S.
13-in. × 11-in. Dallmeyer rectilinear.	Enlarging and copying, constant use.	R.C.S.
8½-in. × 6½-in. Dallmeyer rectilinear.	,, ,, ,,	B.E.
8½-in. × 6½-in. Dallmeyer rectilinear.	,, ,, ,,	B.E.
5-in. × 4-in. Dallmeyer rapid rectilinear.	,, ,, ,,	B.E.
Mirrors.		
36-in. concave mirror.	Equatorially mounted for stellar spectroscopy.	S.M.
30-in. ,, ,,	Equatorially mounted for stellar spectroscopy.	L.
9½-in. Browning-With concave mirror.	Equatorially mounted, as a prismatic reflector, on 6-in. frame.	L.
20-in. short focus concave mirror.	Dismounted.	G.G.C.
16-in. plane mirror.	Mounted on coelostat.	J.P.E.C.
12-in. ,, ,,	,, siderostat.	R.S.
12-in. ,, ,,	,, ,,	R.S.
12-in. ,, ,,	,, ,,	R.S.
6-in. ,, ,,	,, spectroheliograph.	S.P.

* S.P. = Solar Physics Committee.
R.C.S. = Royal College of Science.
G.G.C. = Government Grant Committee.
S.M. = Science Museum.
R.S. = Royal Society.
B.E. = Board of Education.
J.P.E.C. = Joint Permanent Eclipse Committee.
L. Sir Norman Lockyer.

The 4-inch photoheliograph by Dallmeyer, mentioned in a previous report (June 1896) as the property of Greenwich, was returned to Greenwich on January 29, 1901.

The 16-inch plane mirror belonging to the Joint Permanent Eclipse Committee was sent to Greenwich at the end of 1900, and used by Mr. Dyson in Sumatra for the Total Solar Eclipse of May 18, 1901.

VI.—Papers Published or in Preparation.

(1.) The following papers have been published since the date of the last report :—

"Further Note on the Spectrum of Silicium," by Sir Norman Lockyer, K.C.B., F.R.S. Communicated October 26th, 1900. Proc. Roy. Soc. vol. 67, pp. 403–409.

"On the Solar Changes of Temperature and Variations in Rainfall in the region surrounding the Indian Ocean," by Sir Norman Lockyer K.C.B., F.R.S., and W. J. S. Lockyer, M.A., Ph.D., F.R.A.S. Communicated October 26, 1900. Proc. Roy. Soc. vol. 67, pp. 409–431.

"The New Star in Perseus—Preliminary Note," by Sir Norman Lockyer, K.C.B., F.R.S. Communicated February 28th, 1901. Proc. Roy. Soc. vol. 68, pp. 119–124.

"Further Observations on Nova Persei," by Sir Norman Lockyer, K.C.B., F.R.S. Communicated March 7th, 1901. Proc. Roy. Soc. vol. 68, pp. 142–146.

"On the Enhanced Lines in the Spectrum of the Chromosphere," by Sir Norman Lockyer, K.C.B., F.R.S., and F. E. Baxandall, A.R.C.Sc. Communicated March 19th, 1901. Proc. Roy. Soc. vol. 68, pp. 178–188.

"On the Arc Spectrum of Vanadium," by Sir Norman Lockyer, K.C.B., F.R.S., and F. E. Baxandall, A.R.C.Sc. Communicated March 19th, 1901. Proc. Roy. Soc. vol. 68, pp. 189–210.

"Further Observations on Nova Persei—No. 2," by Sir Norman Lockyer, K.C.B., F.R.S. Communicated March 28th, 1901. Proc. Roy. Soc. vol. 68, pp. 230–235.

"The Solar Activity 1833–1900," by William J. S. Lockyer M.A. (Cantab.), Ph.D. (Gött.), F R.A.S. Communicated April 29th, 1901. Proc. Roy. Soc. vol. 68, pp. 285–300.

"Further Observations on Nova Persei No. 3," by Sir Norman Lockyer, K.C.B., F.R.S. Communicated May 17th, 1901. Proc. Roy. Soc. vol. 68, pp. 399–404.

"Observations of the Spectra of Sun Spots (1879–1897)." (This volume has now been published and distributed by the Committee.)

"Total Eclipse of the Sun, January 22, 1898.—Observations at Viziadrug."

Parts I.–III. Communicated March 15, 1900; Part IV. communicated January 17, 1901. The whole paper has now been published in the Phil. Trans., vol. 197, pp. 151–227.

"Further Observations on Nova Persei No. 4," by Sir Norman Lockyer, K.C.B., F.R.S. Communicated October 10th, 1901 Proc. Roy. Soc. vol. 69, pp. 133–137.

"An Attempt to Ascertain the Date of the Original Construction of Stonehenge, from its Orientation," by Sir Norman Lockyer, K.C.B., F.R.S., and F. C. Penrose, F.R.S. Communicated October 21st, 1901. Roy. Soc. Proc., vol. 69, pp. 137–147.

(2.) The following papers are ready for publication :—

"A Catalogue of 470 of the Brighter Stars."

(This paper is now in the press and will shortly be published by the Committee.)

"The Total Solar Eclipse of May 28th, 1900—Final Report on the Expedition to Spain." (In the press.)

"Areas of Sun-spots 1832–1900."

(Reductions of Ely photographs, to fill gaps in the Kew Series, have been made and tabulated.)

[Ready to be submitted to the Committee.]

"The Chemical Origins of the Lines in Nova Persei." (In the press.)

"On the Spark Discharge of Metallic Poles in Water." (In the press.)

"On the Occurrence of Lines of Vanadium and Titanium in the Spectra of various Celestial and Terrestrial Light Sources."

"Further Tables of Wave-Lengths of Enhanced Lines."

(3.) Some of the papers now in hand are as follows :—

"Complete Discussion of the Observations on Nova Persei."

"Sun-spots and Meteorology."

"Discussion of the Widened Lines of Various Elements recorded in the Sun-spot Observations 1879–1901."

"General Comparison of the Metals Represented in various Celestial and Terrestrial Light Sources."

"The Spectrum of P. Cygni."

"The Enhanced lines of Metals of Low Atomic Weight."

"The Spectrum of Magnesium."

"Further Observations on the Spectra of Meteorites."

"The Total Solar Eclipse of August 9th, 1896—Final Report of the Expedition to Novaya Zemlya."

"Observations of β Lyræ."

"The order of appearance of Chemical Substances in Nebulæ."

"Distribution of Sun-spots in Latitude."

"The Spectrum of γ Cassiopeiæ."

"On the occurrence of enhanced lines in arc spectra."

"The relative temperatures of Sirian and Arcturian Stars."

(4.) Below is given the list of the publications of the Solar Physics Committee since its appointment in 1879.

Date of Publication or Distribution.	TITLE.
1880	"Preliminary Report of the Committee on Solar Physics."
1882	"Report by the Committee on Solar Physics."
1889	"Second Report by the Committee on Solar Physics."
July, 1889	"Position and Areas of Sun-spots and Faculae, 1887."
,, ,,	" ,, ,, ,, ,, 1888."
June, 1891	" ,, ,, ,, ,, 1889."
March, 1892	" ,, ,, ,, ,, 1878–1881."
November, ,,	" ,, ,, ,, ,, 1890."
March, 1894	" ,, ,, ,, ,, 1891."
,, 1895	" ,, ,, ,, ,, 1892."
July, 1896	" ,, ,, ,, ,, 1893."
February, 1899	" ,, ,, ,, ,, 1894."
,, ,,	" ,, ,, ,, ,, 1895."
,, ,,	" ,, ,, ,, ,, 1896."
,, ,,	" ,, ,, ,, ,, 1897."
October, 1900	"Spectra of Sun-spots."
April, 1901	"Position and Areas of Sun-spots and Faculae, 1898."
June, ,,	" ,, ,, ,, ,, 1899."

(5.) The following list gives the titles of the papers, &c., on Solar Physics, published by Sir Norman Lockyer, K.C.B., F.R.S., since the appointment of the Solar Physics Committee in 1879.

Date.	Title.	Where published.	Vol.	Page
Dec. 1878	"Researches in Spectrum Analysis in connexion with the Spectrum of the Sun.—No. VII".	Proc. Roy. Soc.	28	157
,, ,,	"Preliminary Note on the substances which produce the Chromospheric Lines."	,, ,, ,,	28	283
Mar. 1879	"Note on some Spectral Phenomena Observed in the Arc produced by Siemen's Machine."	,, ,, ,,	28	425
	"Note on some Phenomena attending the Reversal of Lines."	,, ,, ,,	28	428

Date.	Title.	Where published.	Vol.	Page.
Mar. 1879	"Discussion of Young's List of Chromospheric Lines—Note I."	Proc. Roy. Soc.	28	432
April ,,	"Note on a Recent Communication by Messrs. Liveing and Dewar."	,, ,, ,,	29	45
May ,,	"Note on the Spectrum of Sodium" - - -	,, ,, ,,	29	140
June ,,	"Report to the Committee on Solar Physics on the Basic Lines common to Spots and Prominences."	,, ,, ,,	29	247
,, ,,	"The Cycle of Sun-spots and of Rainfall in Southern India" (J. Norman Lockyer, F.R.S., W. W. Hunter, LL.D., and E. D. Archibald, B.A.).	Submitted to Indian Famine Commission (Macmillan & Co.).	—	—
,, ,,	"On a New Method of Studying Metallic Vapours."	Proc. Roy. Soc.	29	266
Dec. ,,	"On a New Method of Spectrum Observation" -	,, ,, ,,	30	22
,, ,,	"Note on the Spectrum of Hydrogen" - -	,, ,, ,,	30	31
Apr. 1880	"Note on the Spectrum of Carbon" - - -	,, ,, ,,	30	335
May ,,	"Further Note on the Spectrum of Carbon" -	,, ,, ,,	30	461
Oct. ,,	"On a Sun-spot observed Aug. 31st, 1880" - -	,, ,, ,,	31	72
Jan. 1881	"On the Iron Lines widened in Sun-spots" - -	,, ,, ,,	31	343
May ,,	"Note on the Reduction of the Observations of the Spectra of 100 Sun-spots observed at South Kensington."	,, ,, ,,	32	203
Nov. ,,	"Preliminary Report to the Solar Physics Committee on the Sun-spot Observations made at South Kensington."	,, ,, ,,	33	154
Nov. 1882	"Note on the Recent and Coming Total Solar Eclipses."	,, ,, ,,	34	291
Feb. 1884	"On the Most Widened Lines in Sun-spot Spectra. First and Second Series, from Nov. 12, 1879, to Oct. 15, 1881.—Abstract."	,, ,, ,,	36	443
Dec. 1885	"On a New Form of Spectroscope" - - -	,, ,, ,,	39	416
May 1886	"Further Discussion of the Spot-Observations made at Kensington."	,, ,, ,,	40	347
1887	"Chemistry of the Sun" - - - - - -	Macmillan & Co.	—	—
Jan. 1887	"Further Discussion of the Spot-Observations made at Kensington."	Proc. Roy. Soc.	42	37
Nov. ,,	"Researches on the Spectra of Meteorites" -	,, ,, ,,	43	117
Jan. 1888	"Note on the Spectrum of the Aurora" - -	,, ,, ,,	43	320
Mar. ,,	"Suggestions on the Classification of the Various Species of Heavenly Bodies." (*Bakerian Lecture.*)	,, ,, ,,	44	1
Nov. ,,	"Appendix to the Bakerian Lecture" - - -	,, ,, ,,	45	157
Feb. 1889	"Note on the Spectrum of the Rings of Saturn"	,, ,, ,,	45	315
,, ,,	"On the Spectra of Meteor Swarms—Group III."	,, ,, ,,	45	380
Apr. ,,	"On the Wave-Length of the Chief Fluting seen in the Spectrum of Manganese."	,, ,, ,,	46	35
June ,,	"Further Discussion of the Sun-spot Observations made at South Kensington, 1889."	,, ,, ,,	46	385
,, ,,	"On the Causes of variability in Condensing Swarms of Meteorites."	,, ,, ,,	46	401
Nov. ,,	"Comparison of the Spectra of Nebulae and Stars of Groups I. and II. with those of Comets and Aurorae."	,, ,,	47	28

Date.	Title.	Where published.	Vol.	Page.
Nov. 1889	"The Presence of Bright Carbon Flutings in the Spectra of Heavenly Bodies."	Proc. Roy. Soc.	47	39
„ 1890	"The Meteoritic Hypothesis" - - - - -	Macmillan & Co.	—	—
Feb. „	"Note on the Spectrum of the Nebula in Orion"	Proc. Roy. Soc.	48	198
„	"Preliminary Note on Photographs of the Spectrum of the Nebula in Orion."	„ „ „	48	199
May „	"On the Chief Line in the Spectrum of the Nebulae."	„ „ „	48	167
June 1890	"On the Spectra of Comet *a* 1890 and the Nebula G. C. 4058."	„ „ „	48	217
Nov. „	"On the causes which produce the Phenomena of New Stars."	Phil. Trans.	182A	397
„ „	Abstract of above - - - - - - - - -	Proc. Roy. Soc.	49	443
Feb. 1892	"On the New Star in Auriga" - - - - -	„ „ „	50	407
„ „	"Note on the Spectrum of Nova Aurigae" - -	„ „ „	50	431
„ „	"Note on the New Star in Auriga" - - -	„ „ „	50	465
Nov. „	"On the Photographic Spectra of some of the Brighter Stars."	Phil. Trans.	184A	675
„ „	Abstract of above - - - - - - - -	Proc. Roy. Soc.	52	326
Oct. 1893	"On the Photographic Spectrum of Electrolytic Iron."	Phil. Trans.	185A	983
„ „	Abstract of above - - - - - - - - -	Proc. Roy. Soc.	54	359
Dec. „	"On the Photographic Arc Spectrum of Iron Meteorites."	Phil. Trans.	185A	1023
„ „	Abstract of above - - - - - - - - -	Proc. Roy. Soc.	55	139
Feb. 1894	"Preliminary Report on Results Obtained during the Total Solar Eclipse, April 16, 1893."	Phil. Trans.	185A	711
„ „	Abstract of above - - - - - - - - -	Proc. Roy. Soc.	56	7
June „	"On the Photographic Spectrum of the Great Nebula in Orion."	Phil. Trans.	186A	73
„ „	Abstract of above - - - - - - - - -	Proc. Roy. Soc.	56	285
„ „	"The Spectrum Changes of β Lyrae" - - -	„ „	56	278
Nov. „	"On the Photographic Spectrum of γ Cassiopeiae	„ „	57	173
„ „	"Observations of Sun-spot Spectra, 1879-94" -	„ „	57	199
April 1895	"On the New Gas in Uraninite," Prelim. Note -	„ „	58	67
May „	„ „ „ Second „ -	„ „	58	114
„ „	„ „ „ Third „ -	„ „	58	116
„ „	„ „ „ Fourth „ -	„ „	58	192
„ „	„ „ „ Fifth „ -	„ „	58	193
Sept. „	„ „ „ Sixth „ -	„ „	59	4
Mar. 1896	„ „ „ Seventh „ -	„ „	59	342
Aug. 1895	"On the Gases obtained from the Mineral Eliasite."	„ „	59	1
Nov. „	"On the Variable Stars of the δ Cephei class" -	„ „	59	101
Apr. 1896	"Total Eclipse of the Sun, April 16, 1893, Report and Discussion."	Phil. Trans.	187A	551
Nov. „	"Preliminary Report of the Results obtained in Novaya Zemlya with the Prismatic Camera during the Total Eclipse of the Sun, August 9th, 1896."	Phil. Trans.	189A	259

Date.	Title.	Where published.	Vol.	Page.
June 1896	Abstract of the above	Proc. Roy. Soc.	60	272
„ „	"On the Unknown Lines Observed in the Spectra of Certain Minerals."	„ „ „	60	133
Feb. 1897	"On the Iron Lines Present in the Hottest Stars"	„ „ „	60	475
1897	"Sun's Place in Nature"	Macmillan & Co.	—	—
May 1897	"The Total Solar Eclipse of Aug. 9th, 1896. Report on the Expedition to Kiö Island."	Phil. Trans.	190A	1
„ „	Abstract of the above	Proc. Roy Soc.	61	444
Mar. 1897	"Chemistry of the Hottest Stars"	„ „ „	61	148
May „	"On the Classification of the Stars of the δ Cephei Class."	„ „ „	61	445
1897	Recent and Coming Eclipses	Macmillan & Co.	—	—
May 1897	"Furthur Observations of Enhanced Lines"	Proc. Roy. Soc.	61	441
June „	"On the Appearance of the Cleveite and Other New Gas Lines in the Hottest Stars."	„ „ „	62	52
Mar. 1898	"Total Eclipse of the Sun, Jan. 22, 1898. Preliminary Account of Observations made by the Solar Physics Observatory Expedition and the Officers and Men of H.M.S. 'Melpomene.'"	„ „ „	64	27
Nov. „	"Preliminary Note on the Spectrum of the Corona."	„ „ „	64	168
Feb. 1899	"On the Enhanced Lines in the Spectrum of α Cygni."	„ „ „	64	321
„ „	"On the order of Appearance of Chemical Substances at Different Stellar Temperatures."	„ „ „	64	396
Apr. „	"On the Chemical Classification of the Stars"	„ „ „	65	186
Nov. 1899	"Preliminary Table of Wave-Lengths of Enhanced Lines."	„ „ „	65	452
„ „	"Note on the Spectrum of Silicium"	„ „ „	65	449
Jan. 1900	"The Piscian Stars"	„ „ „	66	126
1900	"Inorganic Evolution"	Macmillan & Co.	—	—
Jan. 1900	"The Spectrum of α Aquilæ (Sir Norman Lockyer, K.C.B., F.R.S., and A. Fowler, A.R.C.S.).	Proc. Roy. Soc.	66	232
Feb. „	"Preliminary Note on the Spectrum of the Corona.—Part II."	„ „ „	66	189
June „	"Total Eclipse of the Sun, May 28, 1900. Preliminary Account of the Observations made by the Solar Physics Observatory Expedition and the Officers and Men of H.M.S. 'Theseus' at Santa Pola."	„ „ „	67	137
Nov. „	"Further Note on the Spectrum of Silicium	„ „ „	67	403
„ „	"On the Solar Changes of Temperature and Variations in Rainfall in the Region Surrounding the Indian Ocean" (Sir Norman Lockyer, K.C.B., F.R.S., and William J. S. Lockyer, M.A. (Cantab.), Ph.D. (Gött.).	„ „ „	67	409
Jan. 1901	"Total Eclipse of the Sun, Jan. 22, 1898. Observations at Viziadrug. Pt. IV. 'The Prismatic Cameras.'" Abstract.	„ „ „	68	337
Feb. „	"The New Star in Perseus. Preliminary Note."	„ „ „	68	119
Mar. „	"Further Observations on Nova Persei"	„ „ „	68	142
„ „	"On the Enhanced Lines in the Spectrum of the Chromosphere" (Sir Norman Lockyer, K.C.B., F.R.S., and F. E. Baxandall, A.R.C.Sc. (Lond.).)	„ „ „	68	178
„ „	"On the Arc Spectrum of Vanadium" (Sir Norman Lockyer, K.C.B., F.R.S., and F. E. Baxandall, A.R.C.Sc. (Lond.).)	„ „ „	68	189

Date.	Title.	Where published.	Vol.	Page.
Mar. 1901	"Further Observations on Nova Persei.—No. 2."	Proc. Roy. Soc.	68	230
June „	"Further Observations on Nova Persei.—No. 3."	„ „ „	68	399
„ „	"Total Eclipse of the Sun, May 28, 1900. Account of Observations made by the Solar Physics Observatory Expedition and the Officers and Men of H.M.S. 'Theseus,'" Abstract.	„ „ „	68	404
May „	"The Solar Activity, 1833-1900" (by William J. S. Lockyer, M.A., Ph.D., F.R.A.S.) (communicated).	„ „ „	68	285
Oct. „	"Total Eclipse of the Sun, January 22, 1898. Observations at Viziadrug" by Sir Norman Lockyer, F.R.S., K.C.B., Captain Chisholm-Batten, R.N., and Professor A. Pedler, F.R.S.).	Phil. Trans.	197	151
„ „	"Further Observations on Nova Persei.—No. 4."	Proc. Roy. Soc.	69	133
„ „	"An attempt to ascertain the Date of the Original Construction of Stonehenge from its Orientation" (Sir Norman Lockyer, K.C.B., F.R.S., and F. C. Penrose, F.R.S.)	„ „ „	69	137

(6.) The following list gives the titles of the papers, &c., on Solar Physics published by Sir Norman Lockyer prior to the appointment of the Solar Physics Committee in 1879, referring to work chiefly carried on at South Kensington.

Date.	Title.	Where published.	Vol.	Page.
Oct. 1866	"Spectroscopic Observations of the Sun.—No. I."	Proc. Roy. Soc.	15	256
Nov. 1868	"Spectroscopic Observations of the Sun.—No. II."	Phil. Trans.	159	425
„	Abstract of the above - - - - - - -	Proc. Roy. Soc.	17	128
Mar. 1869	"Spectroscopic Observations of the Sun.—No. III."	„ „ „	17	350
Apr. „	"Spectroscopic Observations of the Sun.—No. IV."	„ „ „	17	415
May „	"Researches on Gaseous Spectra in relation to the Physical Constitution of the Sun, Stars and Nebulae" (in conjunction with E. Frankland, F.R.S.).	Proc. Roy. Soc.	17	453
„ „	"On Recent Discoveries in Solar Physics made by means of the Spectroscope."	Roy. Inst. Lecture.	—	—
July „	"Spectroscopic Observations of the Sun.—No. V."	„ „ „	18	74
Jan. 1870	"Reply to Father Secchi on the Recent Solar Discoveries."	Phil. Mag.	39	61
Jan. 1870	"Remarks on the Recent Eclipse of the Sun as Observed in the United States."	Proc. Roy. Soc.	18	179
Apr. 1870	"Spectroscopic Observations of the Sun.—No. VI."	„ „ „	18	353
Mar. 1872	"On the Eclipse Expedition of 1871" - -	Roy. Inst. Lecture	—	—
Nov. 1872	"Researches in Spectrum Analysis in connection with the Spectrum of the Sun."	Phil. Trans.	163	253
„ „	Abstract of above - - - - - - - -	Proc. Roy. Soc.	21	83
1873	"The Spectroscope and its Applications" (Nature Series).	Macmillan & Co.	—	—

Date.	Title.	Where published.	Vol.	Page.
Jan. 1873	"On a New Method of Viewing the Chromosphere" (J. N. Lockyer and G. M. Seabroke).	Proc. Roy. Soc.	21	105
May „	"Researches in Spectrum-Analysis in connection with the Spectrum of the Sun.—No. II."	Phil. Trans.	163	639
Nov. „	The Bakerian Lecture, "Researches in Spectrum-Analysis in connection with the Spectrum of the Sun.—No. III."	Phil. Trans.	164	479
„ „	"On the Quantitative Analysis of Certain Alloys by means of the Spectroscope (J. N. Lockyer, F.R.S., and William Chandler Roberts).	Phil. Trans.	164	495
„ „	Abstract of the above - - - - - - -	Proc. Roy. Soc.	21	507
Dec. „	"Note Préliminaire sur les Eléments existant dans le Soleil."	Comptes Rendus.	—	—
1874	"Contributions to Solar Physics" - - -	Macmillan & Co.	—	—
Mar. 1874	"Spectroscopic Observations of the Sun" (J. Norman Lockyer, F.R.S., and G. M. Seabroke).	Phil. Trans.	165	577
June „	"Spectroscopic Notes—No. 1. On the Absorption of Great Thicknesses of Metallic and Metalloidal Vapours."	Proc. Roy. Soc.	22	371
June „	"Spectroscopic Notes—No. 2. On the Evidence of Variation in Molecular Structure."	„ „ „	22	37
„ „	"Spectroscopic Notes—No. 3. On the Molecular Structure of Vapours in connexion with their Densities."	„ „ „	22	37
June 1874	"Spectroscopic Notes.—No. 4. On a New Class of Absorption Phenomena."	Proc. Roy. Soc.	22	378
„ „	"Researches in Spectrum-Analysis in connexion with the Spectrum of the Sun.—No. IV."	Phil. Trans.	164	805
„ „	Abstract of the above - - - - - - -	Proc. Roy. Soc.	22	391
Jan. 1875	"Remarks on a New Map of the Solar Spectrum"	„ „ „	23	152
Mar. „	"On the Absorption Spectra of Metals volatilized by the Oxy-Hydrogen Flame" (J. Norman Lockyer, F.R.S., and W. Chandler Roberts).	„ „ „	23	344
Jan. 1876	"Preliminary Note on the Compound Nature of the Line Spectra of Elementary Bodies."	„ „ „	24	352
Mar. „	"Sur de nouvelles raies du Calcium" - - -	Comptes Rendus	—	—
June 1877	"Report on the Total Solar Eclipse of April 6, 1875" (J. N. Lockyer, F.R.S., and Arthur Schuster, Ph.D., F.R.A.S.).	Phil. Trans.	Pt. 1. 1878	139
Dec. „	"Note on the Bright Lines in the Spectra of Stars and Nebulae."	Proc. Roy. Soc.	27	50
1878	"Stargazing, Past and Present," Royal Institution Lectures. (In conjunction with G. M. Seabroke).	Macmillan & Co.	—	—
1878	"Studies in Spectrum Analysis" - - - -	C. Kegan Paul & Co.	—	—
Jan. 1878	"Researches in Spectrum Analysis in connexion with the Spectrum of the Sun."	Proc. Roy. Soc.	27	279
Feb. 1878	"On the Use of the Reflection Grating in Eclipse Photography."	„ „ „	27	107
Mar. „	"Note on the Existence of Carbon in the Coronal Atmosphere of the Sun."	„ „ „	27	308
May „	"Researches in Spectrum Analysis in connexion with the Spectrum of the Sun.—No. V."	Phil. Trans.	Pt. 3. 1881	561
„ „	"Recent Researches in Solar Chemistry." - -	Phil. Mag.	Sept. 1878	161

VII.—Personnel.

Mr. A. Fowler, now Assistant Professor in the Physics Department (Astronomical section) of the Royal College of Science, took part in the control and execution of the night work up to the time of his appointment to his present position (viz., November 15th, 1901). Messrs. Shaw and A. E. Hodgson—teachers in training—also assisted in the execution of the night work up to that date.

Mr. Wm. Shackleton was engaged in the work, as a computer, until he was appointed to the Antarctic Expedition ship "Discovery" on February 26, 1901. Mr. W. E. Rolston was appointed on May 16, to fill up the vacancy and commenced his duties on June 1st, 1901. Mr. A. Cox also assisted in the work until his appointment to the Nautical Almanac Office in November, 1900. Mr. J. P. Wilkie (late lance-corporal R.E.) is occupied with the photographic reductions. Mr. T. Mills, laboratory assistant of the Royal College of Science, assists the observers in the night-work; and Mr. G. H. Kennedy assisted in the general work of the Observatory until the end of November, 1901, when he received an appointment elsewhere. Up to the present time his place has not been filled.

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